

HANDBOOK OF
BRITISH RUBI



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HANDBOOK OF BRITISH RUBI

'How poor the world would be if we could master all its secrets! Difficulties are a call to effort.' B.P. WESTCOTT, *Christian Aspects of Life*, p. 379.

'Ye dwell beside our paths and homes,
Our paths of sin, our homes of sorrow,
And guilty man, where'er he roams,
Your innocent mirth may borrow.
The birds of air before us fleet,
They cannot brook our shame to meet;
But we may taste your solace sweet
And come again to-morrow.'

J. KEEBLE, *Christian Year*, 15th Sunday after Trinity.

H A N D B O O K
O F
B R I T I S H R U B I
B Y

WILLIAM MOYLE ROGERS, F.L.S.

(LATE VICAR OF BRIDGERULE, DEVON)



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P R E F A C E

As a diligent student of British brambles for nearly a quarter of a century I offer this handbook to my fellow-students, with the hope that they will not think me guilty of great presumption in publishing it. They can hardly be more sensible of its shortcomings than I am. But not a few of them have assured me that I can be of service to them in this way. And so, having ventured on a first 'Essay' in the same direction eight years ago when still less qualified than now, I have been encouraged by the unvarying kindness of my botanical friends and correspondents to do my best in the production of this more complete work. I have myself received such continual pleasure and refreshment from the study that I like to persuade myself that I may help some others not to be discouraged by the initial difficulties.

The industry of our leading batologists since Dr. Focke's visit to England in 1889 has been remarkable. As a natural result a considerable number of additional species and varieties have been published in the London *Journal of Botany*; while in a great many instances the earlier known forms have gradually become more clearly defined, long-standing misconceptions as to the nomenclature of several have been removed, and great progress made in tracing the distribution of most of them in all parts of the British Isles.

If more work of the same kind is to be done with the least possible loss of time and energy, and so as to produce still more satisfactory results, a handbook recording and systematising the facts already ascertained, and helping students to test them for themselves, seems an essential.

My main object throughout has been to differentiate and define our various forms as briefly as seemed consistent with exactness. At the same time brevity has been made to yield to exactness where

exactness seemed unattainable without rather considerable fulness. I would venture to urge those who use the book not to shrink from the trouble of studying the introductory 'keys' and 'conspectus,' before they turn to the specific and varietal descriptions which make up the central body of the work. These specific and varietal descriptions are as far as possible complete in themselves; but, for inexperienced batologists at least, the preliminary tables in keys and conspectus should prove helpful to a speedier and surer determination of species and variety than would be possible without them.

Some apology may seem especially desirable on three points;—
(1) The subdivision and multiplication of groups. (2) The partial rearrangement of forms in those groups (after the attempt to fix their order at so recent a date as 1895, in the 9th ed. of the *London Catalogue*). (3) The introduction, in many instances, of subspecies between species and varieties. It is earnestly hoped however that the tendency of all these changes will be towards a simplification of our study of the genus.

(1) Thus, as regards the first point, the cross-alliances and resemblances in the species and subordinate forms are so numerous that all attempts at a grouping which shall be at once natural and open to no unfavourable criticism seem doomed to failure. We are thus driven to the formation of groups which are to a great extent artificial. And even when these are comparatively small it seems hardly possible so to limit the species admitted as to include only those which are obviously excluded from all other groups. The smaller the groups however the less embarrassing becomes this difficulty.

(2) The changes in the order of some of the species and subordinate forms will be found to have arisen naturally in the process of constructing keys and conspectus, such a process necessarily demanding the closest possible attention to the degree in which the several forms are related to one another. But here inevitably there is room for the greatest difference of opinion amongst students, according to the vividness with which resemblances strike various observers in each case.

(3) The forms here ranked as subspecies,—whether reduced from their former position as species or advanced from that of varieties,—are merely those which appear to me intermediate in rank between species and varieties. They can hardly be all of equal

value; but the term *subspecies* sufficiently indicates their intermediate position, and any attempt at definition seems as unnecessary as it would be unpromising or even hopeless. More distinct and constant in character than ordinary varieties they will surely be found, all of them, while most careful botanists might perhaps shrink from giving them full specific rank.

Full details as to the known distribution of all our forms will be found in the Appendix, such details being only briefly summarised in the body of the work. I have however omitted the names of all species and varieties, formerly reported as British, which are now believed to have been wrongly so named, or to have since become extinct. Further research may of course reinstate some of these in our list:—e.g. *R. ammobius* Focke, Dr. Focke himself having suggested that name for a rather immature specimen collected by Mr. Druce in N. Wales last summer. Another plant which I have omitted, *R. laciniatus* Willd.,—the laciniate-leaved form (or forms) so frequent in shrubberies and in waste places near towns,—is apparently unknown as a native plant anywhere. It seems allied to *R. Selmeri* Lindeb. Hybrids are left untouched as demanding too much space for a handbook.

The Irish Rubi are still known very imperfectly, though within the last few years considerable progress has been made in the examination of those growing on the eastern side of the island, and in the Counties Galway, Mayo and Westmeath. Most of our English species have already been found; some of them abundantly. A few forms discovered quite recently are as yet unknown in Great Britain, and this small special list for Ireland seems likely to be somewhat increased within the next ten or twenty years. As far back as 1895 Dr. Focke wrote as follows to the Rev. E. S. Marshall:—‘From the geographical position of Ireland and from several botanical facts we may expect to meet with in that country a few species of S.-W. origin, growing perhaps in the north of Spain or in S.-W. France.’ But he added, ‘I suppose most of the unknown Irish Rubi will prove to be local species or varieties, including perhaps a good deal of hybrids.’

Since misunderstanding has so often arisen in the past in consequence of imperfect or anomalous specimens, a few words on the subject may not be out of place here. Far too commonly the pieces selected by the bramble collector are unrepresentative,

because either gathered out of season, or in some other way deficient or misleading. Over-luxuriant bushes are as much to be avoided as half-starved weaklings. Plants of *Suberecti* and *Cæsii* will often furnish good specimens in June; but it is only in exceptional seasons and very favoured spots that species belonging to the other groups are fit for the collector *before July or after August*. It must also be remembered that the stem-leaves, which supply some of the most characteristic specific features, are not unfrequently still immature when the panicles are already well developed; so that in some instances the stem-pieces must be collected later than the panicles. Ordinarily however through the second half of July and the greater part of August complete and satisfactory specimens may be taken by any careful collector, who will avoid exceptional bushes, and select well-developed *average* panicles together with short leaf-bearing pieces from near the middle of the first year's stem. For really representative specimens two or three such stem-pieces (with one good leaf on each) are desirable, with at least two panicles showing flowers open and in bud. Fruit in addition to flowers should also be aimed at, and brief notes made on the label as to colour and shape of petals, comparative length of stamens and styles, and any other critical features which disappear in the dried pieces. It must be added that the utmost care is needed for assurance that stem and flowering shoot indubitably belong to one and the same plant. Wherever the collector cannot fully satisfy himself on that point, he had far better leave the bushes uncut.

As regards the help extended to me by botanical friends and correspondents (many of them personally unknown to me), mine has been the happy experience so common to botanists, as in great measure no doubt to students in other branches of Natural History. I cannot describe the constant kindness and consideration which I have received; and I feel quite unable adequately to acknowledge it here. Any list that I could now make of those to whom I am thus indebted would be far from exhaustive. I sincerely thank them all. But I must mention that I am under very special obligations, first to friends now taken from us, T. R. Archer Briggs, Professor C. C. Babington, and O. Gelert (of Copenhagen); and no less to many others, my living colleagues and fellow-students. Had it not been for help and guidance given at frequent

intervals in the last twelve years by Dr. W. O. Focke of Bremen, I could not have been in a position to attempt such a work as this. To Mr. K. Friderichsen of Hoyer (Schleswig) I owe many valuable suggestions as to the relation between British and Continental forms. Among my fellow-countrymen the Rev. Augustin Ley has been especially helpful to me by his patient criticism throughout the composition of this book; the Rev. E. S. Marshall, by frequent lengthy translations from German works; and my other colleagues, the Revs. E. F. Linton, W. R. Linton, R. P. Murray, and W. H. Purchas, and Messrs. J. G. Baker, J. E. Bagnall, David Fry, J. T. Powell, and J. W. White, by their ungrudging labour in correspondence and discussion of difficult points. My best thanks are due to the botanical staff at the South Kensington Museum, and especially to Mr. J. Britten and Mr. E. G. Baker, for the unfailing courtesy with which they have helped me to examine the bramble specimens under their charge, as well as for their counsel on many points and their ready sympathy with my work. To Mr. W. A. Clarke I am also under the greatest obligation for his kindness in sharing with me the critical work of revising proofs.

W. MOYLE ROGERS.

BOURNEMOUTH WEST, *April* 1900.

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B. E. C. Rep.—Reports of the Botanical Exchange Club of the British Isles. London. (1860-1897.)

Beitr.—Beiträge zur Flora der Schweiz. (1870.)

Berl. Baumz.—Berlinische Baumzucht. Willdenow. (1811.)

Bluff & Fинг. Comp. Fl. Germ.—Bluff & Fingerhuth, Compendium Floræ Germanicæ. (1825.)

Boenn. Prodr. Fl. Monast.—Boenninghausen, Prodromus Floræ Monasteriensis Westphalorum. (1824.)

Bonpl.—P. J. Mueller, in Bonplandia. (1881.)

Bot. Gaz.—The Botanical Gazette. Edited by A. Henfrey. (1849-1851.)

Bot. Tidsskr.—Botanisk Tidsskrift (Journal de Botanique, Copenhagen).

Boul. Ronces Vosg.—Boulay, Ronces Vosgiennes.

B. R. C. Rep.—Reports of the Botanical Locality Record Club. London. (1873-1886.)

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E. B. Supp.—English Botany. Sir J. E. Smith. Ed. 1. Supplement. London. (1831, etc.)

E. B. ed. 3, Supp.—Supplement to 3rd edition of the last. London. (1892.)

Eng. Fl.—English Flora. Sir J. E. Smith. (1824-1828.)

Ess. Mon. Rub.—Genevier, Essai Monographique sur les Rubus du Bassin de la Loire. (1869.)

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Fl. Aach. Beck.—Kaltenbach, Flora des Aachener Beckens. (1845.)

Fl. Angl. & Carn.—Flora of Anglesey and Carnarvonshire. J. E. Griffith. Bangor. (1895.)

Fl. Berks.—Flora of Berkshire. G. C. Druce. Oxford. (1897.)

Fl. Brit.—Flora Britannica. Sir J. E. Smith. London. (1800-1804.)

Fl. Camb.—Flora of Cambridgeshire. Prof. C. C. Babington. London. (1860.)

Fl. Dan.—Lange, Floræ Danicæ. (1860.)

Fl. Fr.—Grenier & Godron, Flore de France. (1848.)

Fl. Heref.—Flora of Herefordshire. W. H. Purchas & A. Ley. Jakeman & Carver. Hereford. (1889.)

Fl. Plym.—Flora of Plymouth. T. R. Archer Briggs. London. (1880.)

Fl. Schles.—Wimmer, Flora von Schlesien. (1832.)

Hb. Rub. Scand.—Herbarium Ruborum Scandinaviæ.

Hb. Rub. Rhen.—Herbarium Ruborum Rhenanorum. Dr. Ph. Wirtgen. Coblenz. (1855, etc.)

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Lej. & Court. Comp. Fl. Belg.—A. L. S. Lejeune & R. Courtois, Compendium Floræ Belgicæ. (1828-1831.)

Mém. Soc. Acad. M. & L.—Mémoires de la Société Académique de Maine-et-Loire. (1868.)

Mon. Rub.—Genevier, Monographie des Rubus du Bassin de la Loire. Ed. 2. (1880.)

Oefvrs. Vet. Akad. Foerh. Stockh.—Oefversigt vetenskaps akademien foerhandlingan. Stockholm. Vol. 1-32. (1844-1875.)

Phyt.—The Phytologist. London. (1841-1863.)

Pl. rar. Hung.—Waldstein & Kitaibel, Descriptiones et Icones Plantarum rariorium Hungariae. Vol. ii. (1805.)

Pollich.—P. J. Mueller, Pollichia. (1859.)

Poton. Flora.—Potonie's German Flora. (Ed. 3, 1887; ed. 4, 1889.)

Reut. Cat. Pl. Vasc. Genèv.—Reuter, Catalogue des Plantes Vasculaires de Genève. Ed. 2. (1861.)

Rub. Germ.—Rubi Germanici descripti et figuris illustrati. Weihe & Nees. Ueberfaldae. (1822-1827.)

Set.—Set of British Rubi. E. F. Linton, W. R. Linton, R. P. Murray & W. Moyle Rogers. (1892-1897.)

Sp. Pl.—Linnæus, Species Plantarum. (1753.)

Steele.—Handbook of Field Botany. (1847.)

Syn. Brit. Fl.—Lindley, Synopsis of the British Flora. Ed. 1. (1829.)

Syn. R. G.—Dr. W. O. Focke, Synopsis Ruborum Germaniae. Bremen. (1877.)

Top. Bot.—H. C. Watson, Topographical Botany. Ed. 2. London. (1883.)

Trans. Bot. Soc. Edinb.—Transactions of the Royal Society of Edinburgh. Vol. iii. (1794.)

Trans. Linn. Soc.—Transactions of the Linnæan Society. London. Vol. xi. (1815.)

Tratt. Ros.—Vest in Trattinnick, Rosacearum Monographia. Vol. iii. (1823.)

Wats. Exch. Club.—Watson Botanical Exchange Club Reports. (1885-1899.)

ABBREVIATIONS AND EXPLANATIONS

acic.	.	.	.	acicule.	pet.	.	.	.	petal.
bas.	.	.	.	basal (of leaflet in 5-nate leaf),	prk.	.	.	.	prickle.
cal.	.	.	.	calyx.	prklet.	.	.	.	pricklet.
carp.	.	.	.	carpel.	rach.	.	.	.	rachis.
co.	.	.	.	county.	sep.	.	.	.	sepal.
fl.	.	.	.	flower.	sp.	.	.	.	species.
frt.	.	.	.	fruit.	sp. collect.	.	.	.	species collectiva.
hb.	.	.	.	herbarium.	spn.	.	.	.	specimen.
interm.	.	.	.	intermediate (of leaflet in 5-nate leaf).	st.	.	.	.	stem of first year.
l.	.	.	.	leaf.	stam.	.	.	.	stamen.
lt.	.	.	.	leaflet.	stip.	.	.	.	stipule.
lat.	.	.	.	lateral (of lt. in 3-nate leaf).	stkd. gl.	.	.	.	stalked gland.
pan.	.	.	.	panicle.	sty.	.	.	.	style.
ped.	.	.	.	peduncle, pedicel.	subsp.	.	.	.	subspecies.
					t.	.	.	.	figure (<i>tabula</i>).
					v.c.	.	.	.	Watsonian 'vice- county.'
					var.	.	.	.	variety.

Synonyms are printed in italics.

The sign ! after a locality indicates that the author has seen the plant of that locality (living or dried).

When the name of a subspecies or variety is followed by that of its author *in brackets*, this implies that it was published by him as that of a species.

When the sign ? follows the name of a plant, it points to the fact that some doubt exists as to the identification.

HANDBOOK OF BRITISH RUBI

NATURAL ORDER ROSACEÆ.

GENUS RUBUS LINN.

CALYX persistent, of 5 deeply-cut lobes ('sepals'), ebracteolate. Petals 5,—abnormally 5-10,—inserted on the calyx, deciduous, white or reddish. Stamens many, inserted with the petals, in one or more rings. Style filiform, subterminal. Carpels many, succulent ('drupelets'), placed on a dry or spongy conical or flat receptacle, one-seeded. Seed pendulous.

Root perennial. Stem suffruticose or rarely herbaceous, often rooting at end, rarely more than biennial. Leaves alternate, stalked, 3-5-nate, rarely pinnate, the upper ones often simple or 3-fid, subpersistent. Stipules adnate to petiole or (in the herbaceous section of the genus only) to stem or stem and petiole. Flowers in terminal and axillary racemes panicles or corymbs, which in the second year spring from the leafy stem of the first year.

In the *Bellardiani*, and very rarely in other groups, the leafy stem of the first year itself sometimes bears at its extremity a panicle which is usually of exceptional luxuriance. In our herbaceous species (*R. saxatilis* and *R. Chamæmorus*) all the stems are annual and radical, and the flowers subumbellate or subsolitary.

Section A. **Frutescentes.** St. shrubby. Stip. attached to petiole. Fl. paniced or racemose. *Receptacle conical.*

Subgenera:—*Idæobatus* Focke. *Eubatus* Focke.

Section B. **Herbacei.** St. herbaceous or subherbaceous. Stip. attached to st. only or to both st. and petiole. Fl. terminal; solitary or in a subumbellate corymb. *Receptacle flat.*

Subgenera:—*Cylactis* Rafin. *Chamæmorus* Focke.

SECTION A. FRUTESCENTES.

SUBGENUS **IDÆOBATUS** Focke (*Rubi Idæi* Babington).

L. often pinnate. *Ripe frt. separating from the dry receptacle.*
Raspberry.

1. **Rubus idæus** Linn. in *Sp. Pl.*, 492 (1753). *Journ. Bot.* 1886, 5. Rhizome creeping. St. erect, nodding at the top, 4-6 ft., round, downy or glabrate, glaucous, not rooting at tip. Prk. few or many, setaceous, slightly declining. L. 5-pinnate or 3-nate, rarely 7-pinnate. Lts. with close white felt beneath, *rather sharply but irregularly serrate*; term. ovate or oval, with long acuminate point subcordate or entire base and fairly long stalk; upper pair sessile, lower subsessile. Pan. short, racemose or racemose-corymbose. Fl. pendulous, mostly long-pedicelled. Sep.

greenish-white-felted, patent on fall of pet., afterwards reflexed, often aciculate or bristly. Pet. narrow erect white. Stam. in a single ring, about equaling sty. Frt. globose or slightly elongate, the drupelets white with pubescence when young, when ripe red or amber-coloured.

Set of British Rubi (1892-1897), No. 51. Wood borders and thickets. Found now in almost every county of the British Isles and probably indigenous in most of them.

Vice-counties in G. Britain 110. Irish co. generally distributed. Widely distributed in Europe, N. Africa, N. and W. Asia, and N. America.¹

Lees' *R. idaeus* β . *asperrimus* (Steele, p. 60), the 'white raspberry' of our gardens, is a pale form of the type with the setaceous prk. or strong bristles very crowded and tawny (instead of purple) and the ripe frt. amber-coloured. I have met with it (often in considerable quantity) in 7 widely separated British counties and I have seen hb. spns. from 3 others. It may well be a generally though only thinly distributed form, and usually, if not exclusively, of garden origin.

Var. *obtusifolius* (Willd.) in *Berl. Baumg.* ed. 2, 409 (1811). *R. idaeus* *anomalus* Arrh. (1839). *R. Leesii* (Bab.) (1846). *Journ. Bot.* 1877, 369; 1895, 46. Prk. usually reduced to minute stout-based acic. St.-l. 3-nate. Lts. all roundish-ovate, imbricate, coarsely crenate-serrate; term. with very short stalk; lat. nearly or quite sessile. Pan.-l. mostly simple, roundish, cordate, somewhat 3-lobed. 'Frt. generally abortive because the ovaries usually are imperfectly closed' (Focke).

Set, No. 1. Hedges and waste places in many counties from Devon to Perth, rare.

V.C. in G. Britain 18.

Sweden, Germany, Holland.

The var. *rotundifolius* Bab. in *Man.* ed. 8, 107 (1881) is a mere form of var. *obtusifolius*, with a longer-stalked term. It. taking it one short step towards typical *idaeus*. The other vars., described in *E. B. ed. 3 Supp.* pp. 72, 73, seem to be only slightly varying forms of *R. idaeus*.

SUBGENUS EUBATUS Focke (*Rubi fruticosi* Babington).

L. never strictly pinnate. *Ripe frt. adhering to receptacle.*

Bramble; blackberry; dewberry.

KEYS TO GROUPS AND SPECIES.

1. General Key to *armature* of st. and pan.

Groups I. to VII. and IX. St.-prk. equal or subequal, almost or quite confined to the angles. Glandular and acicular development absent from Group I. (except occasionally in the form of sessile and rarely subsessile gl. on st.), very rare in Groups II. and III., in the succeeding groups gradually increasing.

Group VIII. Very transitional. Armature somewhat irregularly mixed; the st.-prk. being usually rather more scattered and unequal than in Groups I. to VII. and IX., while the glandular and acicular development is mostly weak or uncertain on st. or pan., or on both st. and pan.

Groups X. to XII. St.-prk. distinctly unequal. All arms more mixed and scattered.

Groups XIII. and XIV. Prk. scattered on the round or bluntly angled st., often weak and less unequal than in Groups X. to XII.

¹ For detailed account of distribution in the British Isles see Appendix, p. 99.

2. Special Key to Groups and Species.

A. Groups I. to V. St. tall, glabrous or slightly hairy (sometimes more densely hairy in Group V., *Discolores*), not always rooting. St.-prk. normally equal and confined to angles.

GROUP I. **Suberecti.** Root often soboliferous. St. suberect, very rarely rooting at end (never apparently in *R. fissus* and *R. suberectus*); glabrous or very nearly so. Bas. lts. often subsessile. Pan. racemose or subracemose. Sep. externally olive and subglabrescent, with conspicuous white margin. Normally without bloom stkd. gl. or acic.

<i>R. fissus</i> Lindl.	<i>R. plicatus</i> Wh. & N.
<i>R. suberectus</i> Anders.	var. <i>Bertramii</i> G. Braun.
<i>R. Rogersii</i> Linton.	var. <i>hemistemon</i> (P. J. Muell.).
<i>R. sulcatus</i> Vest.	

GROUP II. **Subrhamnifolii.** St. suberect or arcuate, often rooting, subglabrous. Bas. lts. shortly stalked. Pan. subracemose or composite. Sep. externally hairy, olive or grey, somewhat white-margined. Without bloom. Normally eglandular.

<i>R. nitidus</i> Wh. & N.	<i>R. integrifolius</i> P. J. Muell. ?
subsp. <i>opacus</i> Focke.	<i>R. cariensis</i> Genev.
<i>R. affinis</i> Wh. & N.	<i>R. holerythros</i> Focke.
var. <i>Briggsianus</i> Rogers.	<i>R. latifolius</i> Bab.

GROUP III. **Rhamnifolii.** St. arcuate or arcuate-prostrate, rooting, glabrous or very thinly hairy, often much branched. All mature lts. distinctly stalked, strigose above (except in *R. durescens*). Pan. compound, sometimes subracemose above, often densely prickly. Sep. externally grey or whitish, reflexed in frt. (except in *R. carpinifolius*). Without bloom. In a few instances slightly glandular in pan. and even very rarely in st., but normally eglandular.

<i>R. imbricatus</i> Hort.	<i>R. nemoralis</i> P. J. Muell.
<i>R. carpinifolius</i> Wh. & N.	var. <i>glabratus</i> Bab.
<i>R. incurvatus</i> Bab.	var. <i>Silurum</i> A. Ley.
<i>R. Lindleianus</i> Lees.	<i>R. Scheutzii</i> Lindeb.
<i>R. erythrinus</i> Genev.	<i>R. dumnoniensis</i> Bab.
<i>R. durescens</i> W. R. Linton.	<i>R. pulcherrimus</i> Neum.
<i>R. rhamnifolius</i> Wh. & N.	<i>R. Lindebergii</i> P. J. Muell.
subsp. <i>Bakeri</i> F. A. Lees.	

GROUP IV. **Villicaeles.** Hardly separable from *Rhamnifolii*, but making some approach towards *Silvatici* in st. mostly lower and usually hairy (though often only thinly so and liable to become bald ultimately). Prk. subequal, rarely extending to the faces of st. Without bloom. Pan. usually lax or diffuse, very rarely showing some glandular development.

<i>R. mercicus</i> Bagnall.	subsp. <i>calvatus</i> Blox.
subsp. <i>bracteatus</i> Bagnall.	subsp. <i>rhombifolius</i> Weihe.
subsp. <i>chrysoxylon</i> Rogers.	<i>R. gratus</i> Focke.
<i>R. villicaulis</i> Koehl.	<i>R. leucandrus</i> Focke.
subsp. <i>Selmeri</i> (Lindeb.).	
(<i>R. rusticanus</i> Merc.) See Group V., <i>Discolores</i> , p. 40.	
(<i>R. hirtifolius</i> Muell. and Wirtg.) See Group VII., <i>Vestiti</i> , p. 48.	

GROUP V. **Discolores.** St. erect-arcuate or arcuate-prostrate, thinly or densely pubescent or hairy or glabrous, sometimes pruinose, rarely rooting. Lts. with whitish felt beneath, which becomes greenish in

autumn. Pan. hardly narrowed above (except in *R. argentatus*). Usually quite eglandular.

R. ramosus Briggs. var. *clivicola* A. Ley.
R. thyrsoideus Wimmm. *R. rusticanaus* Merc.
R. argentatus P. J. Muell. *R. pubescens* Weihe.
 var. *robustus* (P. J. Muell.). var. *subinermis* Rogers.
 (*R. Lindebergii* P. J. Muell.) See Group III., *Rhamnifolii*, p. 33.

B. Groups VI. and VII. St. mostly arcuate-prostrate and hairy, rarely furnished with a few acic. or stkd. gl. St.-prk. subequal, occasionally somewhat scattered but mostly confined to angles.

GROUP VI. **Silvatici.** St. arcuate-prostrate or climbing, permanently though thinly hairy, usually quite eglandular. Its. mostly hairy or greenish-felted beneath. Pan. rather frequently furnished with a few stkd. gl. and acic.

R. silvaticus Wh. & N. var. *macrophyloides* (Genev.).
 [*R. myrica* Focke.] var. *amplificatus* (Lees).
 var. *hesperius* Rogers. (*R. amphichloros* P. J. Muell.).
R. lentiginosus Lees. *R. Questieri* Lefv. & Muell.
R. macrophyllus Wh. & N. *R. Salteri* Bab.
 subsp. *Schlechtendalii* (Weihe). *R. Colemanni* Blox.
 (*R. nemoralis* P. J. Muell. and var. *glabratus* Bab.) See Group III., *Rhamnifolii*, p. 31.

GROUP VII. **Vestiti.** St. rather densely or very densely hairy, occasionally with a few stkd. gl. and acic. or prklets on the faces. Prk. mostly slender, less constantly equal and less strictly confined to the angles than in Groups I.-VI. and IX. Pan. usually somewhat glandular and aciculate.

R. Sprengelii Weihe. *R. pyramidalis* Kalt.
R. orthoclados A. Ley. subsp. *macranthelos* Marss.
R. micans Gren. & Godr. *R. leucostachys* Schleich.
R. hirtifolius Muell. & Wirtg. var. *gymnostachys* (Genev.).
 var. *danicus* (Focke). subsp. *leucanthemus* P. J. Muell. ?
 var. *mollissimus* (Rogers). *R. lasioclados* Focke.
R. iricus Rogers. var. *angustifolius* Rogers.
 (*R. Boræanus* Genev. *R. vestitiformis* subsp. nov. and *R. adenanthus* Boul. & Gill.) See Group VIII., *Egregii*, pp. 53-58.

C. Groups VIII. to XIII. St. arcuate-prostrate or prostrate. Armature mixed. Bas. Its. distinctly stalked (though only briefly in some of the *Egregii*).

GROUP VIII. **Egregii.** 'A group of transition forms' (as Dr. Focke says of his corresponding *Adenophori*), with armature very variable in quantity and distribution, but usually less conspicuously mixed than in the succeeding groups. St. often nearly prostrate and only rarely very hairy, unequally glandular. Bas. Its. sometimes subsessile. *N.B.*—Many of the species placed in this group could no doubt be attached to other groups without great difficulty; but it seems easier to keep the limits of those groups clearly defined if we retain this as 'a middle and collective group.'

R. criniger Linton. *R. Gelertii* Frider.
R. adenanthus Boul. & Gill. *R. anglosaxonicus* Gelert.
R. Boræanus Genev. subsp. *curvidens* A. Ley.
R. cinerosus Rogers. *vestitiformis* subsp. nov.
R. mucronatus Blox. subsp. *raduloides* Rogers.
nudicaulis var. nov. subsp. *setulosus* Rogers.

R. melanoxylon Muell. & Wirtg. var. *dentatifolius* Briggs.
R. infestus Weihe. *R. Drejeri* G. Jensen.
 var. *virgultorum* A. Ley. subsp. *Leyanus* Rogers.
R. uncinatus P. J. Muell. subsp. *hibernicus* Rogers.
R. Borreri Bell Salt.

(*R. pulcherrimus* Neum.) See Group III., *Rhamnifolii*, p. 32.

(*R. mercicus*, var. *bracteatus* Bagnall.) See Group IV., *Villicaeles*, p. 33.

N.B.—Out of the above list, *raduloides*, *setulosus*, *infestus*, *Drejeri* and *Leyanus* are often found in strong forms which might equally well be placed among the *Koehleriani*.

GROUP IX. **Radulæ.** St. rough with crowded short subequal acic. and stkd. gl. Large prk. subequal (usually equal in typical *R. radula*) and nearly confined to angles. Intermediate prk. absent. While thus strictly limited the members of this group can hardly be confused with those of any other. As in the three succeeding groups, all the pan.-branches except the lowest are usually cymose or umbellate-racemose and not simply racemose. Stkd. gl. and acic. on pan. unequal, mostly short.

<i>R. radula</i> Weihe.	<i>R. oigocladus</i> Muell. & Lefv.
subsp. <i>anglicanus</i> Rogers.	var. <i>Newbouldii</i> Bab.
subsp. <i>echinatoides</i> Rogers.	var. <i>Bloxamianus</i> Colem.
subsp. <i>sertiflorus</i> (P. J. Muell.)?	<i>R. regillus</i> A. Ley.
<i>R. echinatus</i> Lindl.	<i>R. podophyllus</i> P. J. Muell.
<i>R. rudis</i> Wh. & N.	

(*R. adenanthus* Boul. & Gill.) See Group VIII., *Egregii*, p. 53.

(*R. fuscus* Wh. & N.) See Group XI., *Sub-Bellardiani*, p. 73.

(*R. infecundus* Rogers.) See Group XII., *Koehleriani*, p. 80.

GROUP X. **Sub-Koehleriani.** Distinguished from the true *Radulæ* by the strong larger prk. being somewhat more unequal and less strictly confined to the angles of the st., and by the general armature of prklets, acic., etc., being also rather less uniform in length and stoutness; while they differ from the true *Koehleriani* by the less graduated series of glandtipped organs and the comparative rarity with which such organs exceed the hairs on pan.-rachis and ped.

<i>R. Griffithianus</i> Rogers.	subsp. <i>ericetorum</i> (Lefv.).
<i>R. melanodermis</i> Focke.	<i>R. cavatifolius</i> P. J. Muell.
<i>R. Babingtonii</i> Bell Salt.	<i>R. mutabilis</i> Genev.
var. <i>phylothyrsus</i> (Frider.).	subsp. <i>nemorosus</i> Genev.
<i>R. Lejeunei</i> Wh. & N.	<i>R. Bloxamii</i> Lees.

(*R. anglosaxonicus* Gelert and its subsp.) See Group VIII., *Egregii*, p. 57.

(*R. rosaceus* Wh. & N. with its vars. and subsp.) See Group XII., *Koehleriani*, p. 78.

GROUP XI. **Sub-Bellardiani.** The larger prk. not so strong as in Groups IX. and X. and rather more scattered and unequal. St. often less angular. Near the true *Bellardiani*, but usually stouter with a less graduated series of prk. and other arms and a greater tendency to compound branches in the lower half of the pan. Several of the plants in Section II. of *Bellardiani* however (see pp. 90, 91) would hardly be out of place among the *Sub-Bellardiani*.

<i>R. fuscus</i> Wh. & N.	<i>R. scaber</i> Wh. & N.
var. <i>nutans</i> Rogers.	<i>R. thyrsiger</i> Bab.
var. <i>macrostachys</i> P. J. Muell.	<i>R. Lintoni</i> Focke.
subsp. <i>obscurus</i> (Kalt).	<i>R. longithyrsiger</i> Bab.
<i>R. pallidus</i> Wh. & N.	<i>botryeros</i> var. nov.
<i>leptopetalus</i> var. nov.	<i>R. foliosus</i> Wh. & N.

(*R. acutifrons* A. Ley.) See Group XIII., *Bellardiani*, p. 90.

GROUP XII. *Koehleriani* (*Hystrices* Focke). St. low arching or nearly prostrate or climbing, usually indistinctly angled, with scattered prk. prklets acic. bristles and stkd. gl. of varying form and length. Some prk. very strong and (like all the arms) occasionally glandtipped. L. mostly 5-nate. Pan. composite, sometimes subracemose above; lowest branches racemose; middle and often upper cymose or subumbellate, 3 to many flowered; rach. and ped. almost as variously armed as st. Usually large strong plants, with more unequal and varied armature than is found in any other group. Distinguished from the *Sub-Koehleriani* by the greater range of variation in the still more scattered armature, the special abundance of strong bristles passing into acic. and the greater number and greater length of the glandtipped organs.

<i>R. rosaceus</i> Wh. & N.	<i>R. fusco-ater</i> Weihe.
var. <i>hystrix</i> (Wh. & N.)	<i>R. Koehleri</i> Wh. & N.
subsp. <i>infuscatus</i> Rogers.	var. <i>cognatus</i> (N. E. Brown).
subsp. <i>Purchasianus</i> Rogers.	subsp. <i>dasyphyllus</i> Rogers.
subsp. <i>adornatus</i> P. J. Muell.	<i>R. plinthostylus</i> Genev.
subsp. <i>Powellii</i> Rogers.	<i>R. Marshalli</i> Focke & Rogers.
<i>R. hostilis</i> Muell. & Wirtg.	var. <i>semiglaber</i> Rogers.

GROUP XIII. *Bellardiani* (*Glandulosi* Focke). St. mostly prostrate roundish often pruinose. Armature as scattered as in *Koehleriani* and very varied but weaker, the prk. being usually slender and in some instances almost reduced to acic. L. 3-nate or 4-5 nate-pedate, green on both sides. Bas. lts. stalked. Stip. filiform, rarely narrowly linear. Pan. mostly less composite, occasionally reduced to a raceme. Stkd. gl. and glandtipped bristles on pan. usually red or dark purple, mostly very unequal, often considerably exceeding diameter of ped. and hairs on rach. and ped. Usually rather small low-growing plants, occurring chiefly in the woods and thickets of somewhat hilly districts. Many of the sp. very ill-defined and variable. For detailed account of the differences between this group and the *Koehleriani* see Focke, *Syn. R. G.*, 355.

<i>R. viridis</i> Kalt.	subsp. <i>flaccidifolius</i> (P. J. Muell.).
<i>R. Durotrigum</i> R. P. Murr.	subsp. <i>rubiginosus</i> (P. J. Muell.).
<i>R. divexiramus</i> P. J. Muell.	<i>R. acutifrons</i> A. Ley.
<i>R. Bellardii</i> Wh. & N.	<i>R. saxiculus</i> P. J. Muell.
<i>R. serpens</i> Weihe.	<i>R. tereticaulis</i> P. J. Muell.
<i>R. hirtus</i> W. & K.	<i>R. ochrodermis</i> A. Ley.
var. <i>rotundifolius</i> Bab.	<i>R. velatus</i> Lefv.
subsp. <i>Kaltenbachii</i> (Metsch.).	

(*R. scaber* Wh. & N.) See Group XI., *Sub-Bellardiani*, p. 75.

D. (Group XIV.) St. low arching or trailing, pruinose. Prk. scattered mostly acicular and straight. Bas. lts. sessile or very nearly so.

GROUP XIV. *Cæsii* (*Corylifolii* Focke). St. roundish or slightly angular, with many rooting branches. Intermediate acic. and stkd. gl. few (except in some forms of *R. dumetorum*), sometimes absent. Lts. mostly broad; bas. hardly stalked. Stip. often rather broad. Pet. large roundish. Drupelets usually rather few and large. Fl. early and late. See Focke, *Syn. R. G.*, 387.

<i>R. dumetorum</i> Wh. & N.	var. <i>concinnum</i> Warren.
var. <i>ferox</i> Weihe.	var. <i>fasciculatus</i> P. J. Muell.
var. <i>britannicus</i> (Rogers).	<i>R. corylifolius</i> Sm.
var. <i>diversifolius</i> (Lindl.).	var. <i>sublustris</i> (Lees).
var. <i>pilosus</i> Wh. & N.	<i>R. cyclophyllus</i> (Lindb.).
var. <i>rubriflorus</i> Purch.	<i>R. Balfourianus</i> Blox.
var. <i>tuberculatus</i> Bab.	<i>R. cæsius</i> Linn.

CONSPECTUS OF SPECIES

GROUP I. SUBERECTI. See pp. 3, 20.

SECTION I. Prk. subulate or conical. L. often 6-7-nate.
Frt. dark red. (*R. nessensis* Hall), p. 20.

R. fissus Lindl. Prk. many slender subulate scattered. L. plicate hairy beneath. Bas. lts. sessile. Stam. and sty. subequal.

R. suberectus Anders. Prk. few short conical with rather long base, confined to angles, sometimes absent. L. plane pale green subglabrous. Bas. lts. subsessile. Stam. exceeding sty.

SECTION II. Prk. compressed long-based. L. very rarely 6-7-nate (except in *R. Rogersii*). Frt. black, p. 21.

R. Rogersii Linton. L. 5-7-nate, finely evenly serrate, greyish-green. Term. lt. long ovate-acuminate. Sty. and stam. subequal. Frt.-sep. loosely reflexed.

R. sulcatus Vest. L. all 5-nate. Term. lt. oval long pointed; bas. stalked. Pan. elongate. Stam. at first exceeding sty. Frt.-sep. reflexed. Very luxuriant.

R. plicatus Wh. & N. L. plicate. Term. lt. broadly ovate-cordate; bas. subsessile. Pan. subracemose, rather short. Stam. and sty. subequal. Frt.-sep. patent.

Var. **Bertramii** G. Braun. Luxuriant. Term. lt. roundish-ovate long-stalked; bas. shortly stalked. Stam. exceeding sty. Approaches *R. sulcatus*, but smaller with broad lts.

Var. **hemistemon** P. J. Muell. Lts. oval greyish-green, hardly plicate, hairy, with long point. Stam. at first much shorter than sty.

GROUP II. SUBRHAMNIFOLII. See pp. 3, 22.

1. St. suberect, sometimes rooting. Sep. externally olive or greyish.

a. Sep. externally olive with conspicuous white margin (sometimes greyish or wholly grey in *R. affinis*), p. 22.

(i.) Frt-sep. patent or subpatent. Pan. subracemose above. Pet. obovate or oval.

R. nitidus Wh. & N. Prk. crowded, mostly slender; straight or falcate on st., usually strongly hooked on pan. Term. lt. small oval acute. L. and cal. shining.

Subsp. **opacus** Focke. Prk. usually few straight long. Term. lt. large cordate-acuminate, L. opaque above, softly hairy or felted beneath.

(ii.) Frt-sep. reflexed. Pan. with cymose branches. Pet. roundish.

R. affinis Wh. & N. St. very tall. Prk. remarkably long, normally straight. L. thick, wavy at edge, often grey beneath. Term. lt. ovate-cordate-acuminate, gradually attenuate. Sep. reflexed throughout.

Var. **Briggsianus** Rogers. St. lower more arcuate. Term. lt. oval acute. Pan. strongly developed, less leafy above. Sep. loosely reflexed.

b. Sep. externally greyish, less conspicuously white-margined, loosely reflexed or subpatent in frt., p. 24.

R. integrabasis P. J. Muell.? Prk. declining long based. L. only thinly hairy beneath. Term. lt. obovate or oval cuspidate-acuminate. Pan. lax slender, mostly racemose. Whole plant usually slender.

R. cariensis Genev. Prk. strong patent or nearly so. L. deeply incised ashy-felted or softly hairy beneath. Pan. dense compound cylindrical. Strong. (Sometimes abnormally furnished with a few very short stkd. gl. on bracts. and ped.)

2. St. soon arcuate but rarely (if ever) rooting. L. very large. Sep. externally grey (or greyish-olive), mostly patent in frt. Very strong plants, but with pan. normally racemose above. Bracts and stip. sometimes very finely gland-ciliate. P. 25.

R. holerythros Focke. St. lustrous, arcuate almost from the first. L. greyish, softly hairy beneath. Pedicels long. Pet. stam. and (usually) sty. red. Sep. greyish-olive.

R. latifolius Bab. St. very slightly hairy, soon bending quite low. L. dull green, thinly hairy. Pan. narrow, with densely hairy rach. and conspicuous bracts. Sep. grey.

N.B.—The anomalous *R. orthoclados* A Ley, though in some respects recalling the plants in Group II., is placed among the *Vestiti* (p. 47) on account of its hairy st. and considerable glandular development.

GROUP III. RHAMNIFOLII. See pp. 3, 26.

1. Term. lt. about thrice the length of its stalk, ovate oval or obovate (roundish-obovate-cordate in *R. imbricatus*).

a. L. chiefly 5-nate-digitate.

R. imbricatus Hort. Prk. usually rather small. Lts. convex, wrinkled, mostly imbricate. Pan. narrow above, usually with long strongly ascending racemose lower branches.

R. carpinifolius Wh. & N. Prk. many, strong. Lts. plicate, soft beneath; term. long oval-acuminate. Pan. pyramidal or subracemose. Frt.-sep. patent. Pet. normally white. Very prickly and usually pale in colour.

R. incurvatus Bab. Prk. triangular based. Lts. concave, with thick soft felt beneath; term. broadly ovate-cordate. Pan. long, usually with short branches. Floral organs all pink.

R. Lindleianus Lees. St. glossy. Lts. wavy-edged, mostly narrowing to their base. Pan. dense cylindrical-truncate with patent branches. Pet. white. Frt. small.

b. L. 5-nate-pedate, p. 28.

R. erythrinus Genev. St. dark purple. Lts. convex, obovate-cuspidate-acuminate, usually ashy-felted beneath. Pan. pyramidal with narrow rounded top. Frt. large.

R. durescens W. R. Linton. Lts. oblong-ovate, with principal teeth patent, glabrous above, thinly hairy beneath. Pan. rather short, with patent branches above and broad but hardly truncate top.

2. Term. lt. about twice the length of its stalk, roundish or broadly oval, p. 29.

R. rhamnifolius Wh. & N. Lts. finely toothed, white-felted beneath; term. often barely twice the length of its stalk, cuspidate cordate. Pan. rather close. Pet. roundish white.

Subsp. *Bakeri* F. A. Lees. Dwarf. Lts. like those of *R. rhamnifolius* but smaller, green and hardly felted beneath, with longer point. Pan. with many long branches; very floriferous. Pet. obovate, pink.

R. nemoralis P. J. Muell. Lts. green on both sides, slightly paler and thinly hairy beneath. Pan. long lax leafy, at first pyramidal then corymbose. Pet. pink.

Var. *glabratus* Bab. Pan. narrow, cylindrical, with subequal lower branches long-pedicelled small fl. and very white-felted rach. and ped.

Var. *Silurum* A. Ley. Term. lt. broader below than in type (*i.e.* oval-roundish instead of obovate-roundish) and more gradually acuminate. Pan. in great part ultra-axillary, truly pyramidal. Pet. faint lilac.

R. Scheutzii Lindeb. St. glabrous or subglabrous, shining. Lts. concolorous, thinly hairy; term. broadly rotund-cuspidate. Pan. long, narrow, leafy. Pet. large, pale lilac. Very prickly.

R. dumnoniensis Bab. St. with some short crisp hair (at first). Prk. long, subulate, crowded. Lts. large, white-felted beneath. Pan. pyramidal. Pet. large, roundish, white.

3. St. hairy for this group. Lts. finely toothed; term. obovate-acuminate, long-stalked. Pan. very long. P. 32.

R. pulcherrimus Neum. Prk. patent or declining. L. not unfrequently 6-7-nate. Lts. opaque above; term. from $2\frac{1}{2}$ to more than 3 times the length of its stalk. Pan. normally with pink pet. and some stkd. gl.

R. Lindebergii P. J. Muell. Prk. stout, partly falcate or hooked, especially on pan. L. constantly 5-nate. Lts. pale grey-green; term. about twice as long as its stalk. Pan. eglandular, with large white pet.

GROUP IV. VILLICAULES. See pp. 3, 33.

1. Pan. diffuse, or irregularly branched.

a. St. bluntly angled, thinly hairy. Frt.-sep. reflexed.

R. mercicus Bagnall. Prk. irregularly scattered, strongly declining. Lts. thinly hairy beneath; term. roundish, more than twice the length of its stalk. Pan. sometimes slightly glandular. Pet. white, fading to pink. St. and rach. dark purple. P. 33.

N.B.—For subsp. *bracteatus* and *chrysoxylon* see below in Sect. 2.

R. leucandrus Focke. Prk. partly patent. Lts. softly hairy beneath. Pan. eglandular. Fl. showy; floral organs all white. (Between *R. affinis* and *R. gratus*.) P. 37.

b. St. very stout, furrowed, often glabrate. Frt.-sep. patent or clasping.

R. gratus Focke. Prk. short, broad-based, patent or slightly declining, Lts. at first softly hairy, ultimately nearly bare beneath. Pan. with widespreading few-flowered branches. Pet. pink. Luxuriant. P. 36.

2. Pan. elongate; cylindrical or pyramidal.

a. Pan. pyramidal. Prk. moderate, declining or falcate.

R. bracteatus Bagnall. Lts. greyish, finely closely toothed, often felted beneath; term. obovate. Pan. remarkably elongate and narrowed above, felted, considerably glandular. Bracts many. (Subsp. of *R. mercicus* Bagnall.) P. 33.

R. rhombifolius Weihe. Lts. rhomboid or ovate, acuminate, green or white-felted beneath. Lower pan.-branches long, strongly ascending. Floral organs usually all red. Sep. reflexed. (Subsp. of *R. villicaulis* Koehl.) P. 36.

b. Pan. cylindrical, leafy.

(i.) Prk. weak, somewhat scattered and unequal. Frt.-sep. subpatent.

R. chrysoxylon Rogers. St. ochreous or fuscous. L. 3-5-nate, pale, with finely incised compound teeth. Pan. with long-stemmed branches. Stkd. gl. scattered, usually few. (Subsp. of *R. mercicus* Bagnall.) P. 34.

R. calvatus Blox. St. reddish. Lts. convex, harsh beneath, with patent teeth; term. oblong, with short point and cordate base. Pan. long, lax, often glandular. (Subsp. of *R. villicaulis* Koehl.) P. 35.

(ii.) Prk. strong, confined to angles. Frt.-sep. reflexed.

R. villicaulis Koehl. St. hairy. Prk. long, straight, many. Lts. ovate or oval acuminate, softly hairy or felted beneath. Pan. with prk. chiefly long, slender, declining. Stam. far exceeding sty. P. 34.

Subsp. *Selmeri* Lindeb. St. and l. less hairy. Prk. falcate. Lts. concave, roundish-ovate, with wavy edge. Stam. short, often barely equaling sty. P. 35.

GROUP V. DISCOLORES. See pp. 3, 37.

1. St. erect-arcuate, rarely rooting, glabrous or very nearly so, furrowed.

R. ramosus Briggs. L. 3-5-nate-pedate. Lts. convex, shining above, coarsely serrate; term. oblong or obovate cuspidate. Pan. lax, with long branches. Frt. small, poor.

R. thyrsoideus Wimm. L. 5-nate-digitate. Lts. flat or concave, often incised-serrate; term. oval or ovate, acuminate. Pan. elongate, cylindrical above. Frt. fine.

2. St. arcuate-prostrate or climbing, often rooting, hairy or pubescent.

a. St. somewhat pruinose, p. 39.

R. argentatus P. J. Muell. Prk. (st. and pan.) long, rather unequal, straight or falcate. L. 5-nate-digitate or pedate. Pan. lax, narrowed above, with showy long-pedicelled bright pink fl. and thick villous hair on rachis.

Var. *robustus* (P. J. Muell.). Very strong and prickly. L. thick, irregularly and deeply cut. Pan. less narrowed above.

Var. *clivicola* A. Ley. Prk. weaker. Term. lt. short, roundish-obovate, with long cuspidate or cuspidate-acuminate point. Pan. with long corymbose-cylindrical ultra-axillary part. Pet. faintly pink.

R. rusticanus Merc. St. furrowed, pruinose. Lts. glabrous above, usually cuspidate. Pan. and ped. with close-pressed felt and very broad-based hooked prk. Sep. reflexed (fl. and frt.).

b. St. epuruinose, pubescent.

R. pubescens Weihe. L. 5-nate-digitate. Lts. oval or obovate-acuminate, thinly hairy above, irregularly serrate. Pan. elongate, felted, hairy, with hooked prk. Sep. with upcurved tip.

Var. *subinermis* Rogers. L. 3-5-nate-pedate. Pan. quite unarmed or with few declining prk.

GROUP VI. SILVATICI. See pp. 4, 41.

1. Pan.-prk. normally acicular, declining; in some forms of *R. lentiginosus* stronger, falcate.

a. Frt.-sep. reflexed. Stam. considerably exceeding sty.

R. silvaticus Wh. & N. L. 5-nate. Pan. rather dense, elongate, with crowded acicular prk. Eglandular. Carp. hairy.

b. Frt.-sep. patent or erect. Stam. and sty. subequal.

(i.) Pan. almost unarmed; its prk. when present very few, subulate, p. 42.

R. myricæ Focke. L. mostly 3-nate, evenly simply dentate. Pan. rather lax and little branched. Sep. embracing frt.

(ii.) Pan.-prk. many, mostly acicular, declining; in *R. lentiginosus* occasionally stronger, falcate, with some stalked and subsessile glands.

Var. *hesperius* Rogers. L. broad, mostly 5-nate-pedate, with very compound finely pointed teeth. Pan. elongate, pyramidal, compound. Frt.-sep. patent.

R. lentiginosus Lees. L. 3-5-nate, with very finely pointed compound

incised teeth. Pan. racemose-truncate above, with long-pedicelled fl. Frt.-sep. erect.

2. Pan.-prk. at most only moderately strong, chiefly declining.

a. Pan. normally eglandular. Frt.-sep. reflexed. P. 43.

R. macrophyllus Wh. & N. L. 5-nate-digitate, glabrescent above. Term. lt. ovate-cordate, with long acuminate point. Pan. lax, with grey-felted and hairy rach. medium-sized fl. and strongly reflexed sep.

Subsp. *Schlechtendalii* Weihe. L. hairy above, 5-nate-pedate or digitate. Term. lt. obovate-cuneate-cuspidate, with comparatively short point and crowded fine teeth in upper half. Pan. usually short, with broader upper l. larger fl. and less strongly reflexed sep.

b. Pan. somewhat glandular. Frt.-sep. loosely reflexed or subpatent (in *R. Questierii* usually strongly reflexed). P. 44.

Var. *macrophyloides* (Genev.). Very near *R. Schlechtendalii*, but with laxer glandular pan. subpatent frt.-sep. and more compound incised leaf-tothing.

Var. *amplificatus* Lees. Also very near *R. Schlechtendalii*, but more prickly, with term. lt. longer pointed and more deeply incised, and pan. usually longer with very long lower branches, narrow simple floral l. above and loosely reflexed frt.-sep.

(**R. amphichloros** P. J. Muell. L. 3-5-nate, finely evenly serrate. Term. lt. roundish-oval. Pan. long, lax. Sep. loosely reflexed. Thought by Dr. Focke to be distinguished from *R. amplificatus* by the shape and fine serration of the lts.)

R. Questierii Lefv. & Muell. L. 5-nate-digitate or pedate, concolorous. Lts. oval or obovate-acuminate. Pan. long, lax, normally narrow, with patent upper branches, and whitish-felted rach. and cal. Frt.-sep. strongly reflexed.

c. Pan. usually having a few sunken glands. Frt.-sep. clasping. P. 45.

R. Salteri Bab. L. chiefly 5-nate-pedate, with compound incised teeth in upper half. Term. lt. long stalked with long point and entire or somewhat cordate base.

(*R. lentiginosus* Lees. See above in Section 1 of this group.)

3. Pan.-prk. very strong, long-based, often hooked, p. 46.

R. Colemanni Blox. St. with many strong prk. and occasional acic. and stkd. gl. L. 5-nate-pedate. Lts. convex, concolorous. Pan. long, pyramidal. Frt.-sep. loosely reflexed.

GROUP VII. VESTITI. See pp. 4, 46.

1. Stam. not connivent. Carp. hairy.

R. Sprengelii Weihe. St. roundish, hairy, often slightly glandular. L. mostly 3-nate, concolorous. Pan. with long patent branches, usually glandular.

2. Stam. connivent. Carp. glabrous or nearly so.

a. St. very high arching or suberect. Sep. externally olive, with narrow white margin, embracing frt.

R. orthoclados A. Ley. St. with some subsessile glands. L. 3-5-nate-pedate, concolorous. Pan. weak, glandular. Abnormal.

b. St. arcuate-prostrate, rather densely hairy. Pan. elongate. Sep. ashy-felted.

(i.) Term. lt. usually quite 3 times longer than its stalk.

R. micans Gren. & Godr. St. slightly glandular. L. 3-5-nate-pedate. Lts. acuminate, with incised teeth. Frt.-sep. strongly reflexed. Whole plant greyish.

(ii.) Term. lt. from 2 to $2\frac{1}{2}$ or rarely 3 times the length of its stalk.

R. hirtifolius Muell. & Wirtg. St. rarely glandular or aciculate. L. 5-nate. Lts. with shining close hair or greenish felt beneath; term. variable, usually ovate-acuminate. Pet. narrow, pinkish, fugacious. Frt. oblong, with clasping sep.

Var. *danicus* Focke. Lts. with shallow teeth and shining close hair beneath; term. roundish-obovate. Pan.-prk. long. Fl. very showy, white. Frt.-sep. subpatent.

Var. *mollissimus* (Rogers). Lts. flaccid, with fine incised teeth and very soft greyish felt beneath; term. roundish oval, rarely obovate. Pan.-prk. mostly acicular. Fl. very showy, pale lilac. Frt.-sep. loosely reflexed or subpatent.

(iii.) Term. lt. often 4 times the length of its stalk. Prk. long pointed.

R. iricus Rogers. Lts. thick, ashy-felted beneath when young; term. broadly ovate-acuminate, with compound teeth. *Pan. broad, truncate. Fl. bright pink.* Sep. reflexed. *Very stout and hairy.*

R. pyramidalis Kalt. L. 5-nate-digitate. Lts. almost velvety beneath, coarsely toothed. Pan. pyramidal, with short patent branches. Frt.-sep. reflexed.

Var. *macranthelos* Marss. Prk. smaller, passing into strong acic. Term. lt. subrotund, cuspidate. Pan.-branches long. Frt.-sep. patent.

c. St. densely hairy; its prk. long, usually with some sunken prklets acic. or stkd. gl. L. very softly hairy.

(i.) Pan.-prk. long, strong, subulate. P. 50.

R. leucostachys Schleich. Prk. very strong. Lts. and pet. roundish. Stkd. gl. usually few. Frt.-sep. normally reflexed.

Var. *gymnostachys* (Genev.) Lts. and pet. oval or obovate. Pan. elongate, narrow, with acicular prk. as well as long ones.

(*R. vestitiformis* subsp. nov.) See below, p. 58, under *R. anglosaxonicus*.

(*R. adenanthus* Boul. & Gill.) See Group VIII., *Egregii*, p. 53.

(ii.) Pan.-prk. mostly weak. P. 51.

R. leucanthemus P. J. Muell.? St.-prk. many, slender, sometimes acicular. Term. lt. broadly ovate-acuminate, with compound finely pointed teeth. Pan. rather lax, with rigid branches. Pet. white. Frt.-sep. subpatent.

(iii.) Pan.-prk. crowded, partly falcate. Frt.-sep. patent or subpatent.

R. lasioclados Focke. St. and pan.-rach. very densely hairy. L. whitish-felted beneath, with rather irregular incised teeth. Term. lt. oval or roundish. Pan. broad, very prickly. Pet. white.

Var. *angustifolius* Rogers. Lts. remarkably long and narrow, with very shallow teeth; term. oblong-oval, long-stalked. Pet. pink.

(*R. Boraeanus* Genev.) See Group VIII., *Egregii*, p. 54.

GROUP VIII. EGREGII. See pp. 4, 52.

1. Bas. lts. distinctly stalked even in summer. (*Adenophori petiolulati* Focke.)

a. St. densely hairy, glaucous. About $\frac{1}{3}$ of pan. ultra-axillary.

R. criniger Linton. L. chiefly 5-nate-pedate, greyish-green. Term. lt. ovate-acuminate, irregularly lobate-serrate. Pan. narrowed above. (Subsp. of *R. Gelertii* Frider.) P. 52.

b. St. moderately or rather considerably hairy. From $\frac{1}{3}$ to nearly $\frac{1}{2}$ of pan. ultra-axillary.

(i.) L. with wavy edge and compound teeth. St. with scattered prklets, tubercles and stkd. gl. on faces.

R. adenanthus Boul. & Gill. St.-prk. strong, with a good many prklets and stkd. gl. L. 3-5-nate-pedate, ashy-felted beneath, with com-

pound incised teeth. Pan. considerably glandular. Sep. long, patent or ascending on fall of pet. P. 53.

R. Boræanus Genev. L. 5-nate-pedate and 3-nate. Pan. cylindrical, very weakly armed. Pet. and sty. dark red. Stam. barely equalling sty. P. 54.

R. curvidens A. Ley. L. large, 5-nate-digitate. Lts. with nearly parallel sides and patent teeth. Pan. large, lax, with many slender acic. and unequal stkd. gl. and usually several simple l. above. Stam. exceeding sty. (Subsp. of *R. anglosaxonicus*.) P. 57.

R. vestitiformis subsp. nov. St. glaucous. Lts. roundish, with greyish felt and shining hairs beneath. About $\frac{1}{2}$ pan. ultra-axillary; rach. densely villous. Stam. far exceeding sty. (Subsp. of *R. anglosaxonicus*.) P. 58.

(ii.) L. with shallow even teeth. St. with few or no stout-based pricklets. Acic. and stkd. gl. variable.

(*R. pulcherrimus* Neum.) See Group III., *Rhamnifolii*. P. 32.

R. cinerosus Rogers. Armature (st. and pan.) variable, always considerably mixed and glandular. Term. lt. roundish-obovate. Pan. rather broadly cylindrical, with patent branches. P. 54.

R. mucronatus Blox. Prk. very slender. Lts. thin, with simple shallow teeth; term. obovate-truncate-mucronate. Pan. lax, usually raceme above, with long-pedicelled fl. and crowded bristles and stkd. gl. P. 55.

c. St. glabrous or subglabrous.

(i.) Pan. normally as in Sect. b. (i.e. from $\frac{1}{3}$ to nearly $\frac{1}{2}$ ultra-axillary).

(1) L. pale-green and very softly hairy beneath.

nudicaulis var. nov. Stout. St. subglabrous. L. thick, very softly hairy beneath, with compound teeth. Otherwise hardly different from the typical plant as described by Bloxam. P. 56.

(2) L. normally grey-felted beneath, especially when young.

a. Sep. reflexed in fl. and frt., sometimes only loosely.

R. Gelertii Frider. Stout. Prk. long, subequal. Lts. large, coarsely and irregularly toothed, long-pointed. Pan. very composite, usually broad with rounded top. P. 56.

β. Sep. partly subpatent or even erect with young frt.

R. raduloides Rogers. Prk. and acic. many, very unequal. Lts. with incised, compound, finely pointed teeth; term. broadly ovate-acuminate. Ultra-axillary pan.-top long, cylindrical. (Subsp. of *R. anglosaxonicus*.) P. 58.

R. setulosus Rogers. Usually still more prickly and glandular than the last, the armature in extreme examples being quite Koehlerian. Term. lt. obovate-obtusangular. Pan. more leafy above, laxer below. (Subsp. of *R. anglosaxonicus*.) P. 58.

(ii.) About $\frac{1}{4}$ of pan. ultra-axillary.

R. anglosaxonicus Gelert. Prk. strong. Pricklets many, scattered. Lts. thick, greyish-felted beneath; term. oval, parallel-sided, shortly pointed. Pan. with strongly ascending few-flowered branches. P. 57.

For subsp. *curvidens vestitiformis raduloides* and *setulosus* see above.

R. melanoxylon Muell. & Wirtg. Armature partly strong, but very variable. St. and pan.-rach. blackish-brown or dark purplish-brown. Term. lt. roundish-acuminate, with even toothing. P. 59.

2. Bas. lts. almost sessile in summer, with stalk becoming a little longer in autumn. (*Adenophori subcorylifolii* Focke.)

a. St. usually subglabrous. Sep. patent or erect on fall of pet. (Often sub-Koehlerian in armature.)

R. infestus Weihe. St. high at first. Prk. mixed; declining, falcate and hooked. Lts. pale and often felted beneath; term. broadly ovate-acuminate. Pet. almost round. P. 59.

Var. *virgultorum* A. Ley. St. lower. Armature mixed; but falcate and hooked prk. fewer. Lts. shorter, more nearly round. Pan. broad. Sep. ultimately reflexed. (Between *R. infestus* and *R. Borreri*.) P. 60.

R. Leyanus Rogers. St. shining, pale. Prk. short, declining. Lts. long-pointed, soft and often grey-felted beneath, sharply evenly toothed. Pan. much narrowed in the ultra-axillary top. (Subsp. of *R. Drejeri*. See below, p. 62.)

b. St. hairy.

(i.) Sep. reflexed in fl. and frt.

R. uncinatus P. J. Muell. Armature all slender. Lts. thin, usually rather softly hairy in exposure, greyish-felted beneath. Pan. narrow, cylindrical, very hairy, with prk. mostly falcate or hooked. P. 60.

(ii.) Frt.-sep. at first patent or erect.

R. Borreri Bell Salt. St. almost prostrate, yellowish-brown. Prk. crowded. Acic. and stkd. gl. mostly small. Term. lt. obovate-cuspidate. Pan. with broad rounded top and many unequal (chiefly sunken) stkd. gl. P. 61.

Var. *dentatirolius* Briggs. St. with fewer stkd. gl., furrowed. Lts. nearly oval, with very long gradually-acuminate point. P. 61.

R. Drejeri G. Jensen. St. fuscous, dull. L. 3-5-nate, concolorous. Lts. shortly pointed, roundish-obovate, with shallow rather irregular teeth, harsh beneath. Pan. long, lax, narrow. Often sub-Koehlerian in armature. P. 62.

(Subsp. *Leyanus* Rogers.) See above in Subsection *a*.

Subsp. *hibernicus* Rogers. Leaf-toothing loose, sinuate. Pan. very lax and glandular, slightly armed, much narrowed above. Somewhat intermediate between *R. Drejeri* and *R. Leyanus*. P. 62.

(*R. podophyllus* P. J. Muell.) See Group IX., *Radulæ*, p. 67.

GROUP IX. RADULÆ. See pp. 5, 63.

1. Stkd. gl. on pan.-rach. and ped. mostly sunken in the patent hairs; well-marked acic. usually few or none. Stkd. gl. and acicular organs on st. crowded.

a. L. with ashy or greenish-grey felt beneath.

R. radula Weihe. Prk. rather few, very strong, all on the angles, about equal. Faces of st. with very short subequal mixed armature. Term. lt. broadly ovate-acuminate. Pan. pyramidal, with strong prk.

Subsp. *anglicanus* Rogers. Prk. weaker, many, more scattered, only subequal. General armature showing rather more range of variation. Term. lt. narrow, obovate or oval, finely toothed. Pan. cylindrical, with weak prk.

Subsp. *echinatoides* Rogers. St. glabrous. Prk. rather more variable, occasionally hooked. Lts. all obovate, with compound incised teeth, often greener and only hairy beneath. Pan. much like that of *R. radula*.

Subsp. *sertiflorus* Muell. & Lefv. ? Prk. chiefly short, often hooked. Lts. uniformly narrow, somewhat cuneate, with shallow teeth, soon greenish beneath. Pan. rather narrow, with hooked prk. and small fl.

R. echinatus Lindl. Prk. strong, nearly equal. Lts. thick, incised-lobate, all greyish-felted beneath. Pan. very narrow, with large fl. strongly reflexed sep. and declining prk.

R. rудis Wh. & N. St. glabrous. Prk. many, short. Glands very abundant, sessile and shortly stalked. L. large. Pan. diffuse, with many slender-pedicelled small fl.

b. L. normally green and rather thinly hairy beneath (in vars. *Newbouldii* and *Bloxamianus* sometimes thinly felted). P. 65.

R. oigocladus Muell. & Lefv. ? St. bluntly angled, dark, glaucous,

thinly hairy. Term. lt. obovate-cuspidate, much narrowed towards base.

Var. *Newbouldii* (Bab.)? St. furrowed, paler, not glaucous, densely hairy. Term. lt. shorter, roundish-obovate with long point.

Var. *Bloxiamicus* Colem. St. glabrous or nearly so, densely glandular. Term. lt. roundish-obovate with rather short point.

R. regillus A. Ley. St. bluntly angled, pale, glaucous, hairy, very leafy. Term. lt. oblong, with long cuspidate point.

(*R. radula*, var. *echinatoides* Rogers.) See above, in Subsection *a*.

2. Stkd. gl. and numerous acic. on pan.-rach. and ped., though rarely long, usually far exceeding the close felt or very short hairs. Stkd. gl. and acic. on st. more thinly and unequally scattered, sometimes nearly absent. P. 67.

R. podophyllus P. J. Muell. St. bluntly angled, dark, usually subglabrous. Term. lt. oval-oblong, with rather short cuspidate point. Less distinctly Radulan than the other species of the group.

(*R. adenanthus* Boul. & Gill.) See Group VIII., *Egregii*, p. 53. (*R. infecundus* Rogers.) See Group XII., *Koehleriani*, p. 80. (*R. fuscus* Wh. & N.) See Group XI., *Sub-Bellardiani*, p. 73.

GROUP X. SUB-KOELHERIANI. See pp. 5, 68.

1. Glandtipped organs on pan.-rach. almost wholly sunken in the patent hairs.

a. Frt.-sep. subpatent, at least for a time. Lts. thick.

(i.). Lts. with whitish felt beneath. Stam. long.

R. Griffithianus Rogers. St. and very unequal prk. deep red. Term. lt. roundish-obovate-acuminate. Pan. rather narrow, lax, nearly cylindrical. P. 68.

(ii.). Lts. usually softly hairy beneath. Stam. rather short.

R. Babingtonii Bell Salt. St. and subequal prk. fuscous. Term. lt. oblong-oval-cuspidate. Pan. broad, cylindrical-truncate, with patent branches and acicular prk. P. 69.

R. Bloxiamicus Lees. St. and rather weak prk. purplish-red. Term. lt. broadly obovate. Pan. broadly pyramidal, round-topped with long ascending lower branches. Sep. patent or subpatent for a time, soon loosely reflexed. P. 72.

(*R. mutabilis* Genev.) See below in subsection *b*.

b. Frt.-sep. reflexed. Lts. rather thin. Stam. long.

(i.) Lts. thinly hairy beneath.

R. melanodermis Focke. St. and rather unequal prk. blackish-purple. Lts. very plicate, green; term. obovate-truncate. Pan. narrow cylindrical. P. 69.

R. Babingtonii Bell Salt., var. *phyllothrysus* (Frider.). St. fuscous. Term. lt. obovate-acuminate. Pan. broad, with strong falcate prk. and several simple l. P. 70.

(For typical *R. Babingtonii* see above in Subsection *a*.)

(ii.) Lts. softly hairy or with rather close felt beneath,—at least when young.

R. cavatifolius P. J. Muell. St. and rather unequal prk. pale or reddish-brown. Lts. yellowish-green; term. broadly cordate-ovate-acuminate. Pan. nearly cylindrical, truncate. P. 71.

R. mutabilis Genev. Lts. very long and narrow, deeply incised, with close pale felt beneath; term. narrowed at both ends. Pan. very large, nearly cylindrical. P. 71.

(For subsp. *nemorosus* Genev. see below, in Section 2.)

2. Glandtipped organs on pan.-rach. more unequal, rather frequently exceeding the short hairs or felt.

a. Frt.-sep. reflexed, with rather close felt.

R. Lejeunei Wh. & N. Lts. thin, light green; term. obovate-rhomboidal. Pan. loosely pyramidal, with slender unequal armature. Pet. broad, bright pink. P. 70.

Subsp. *ericetorum* (Lefv.). Stronger. Lts. with longer point, grey-felted beneath. Pan. very long, pyramidal-corymbose, more prickly and glandular. Pet. narrow, white or pinkish. P. 71.

b. Sep. rising on fall of pet.

R. mutabilis Genev., subsp. *nemorosus* Genev. Lts. thick, with subvelvety felt beneath; term. cordate-ovate-acuminate. Pan. pyramidal, interrupted. P. 71.

(For typical *R. mutabilis* see above, in Section 1.)

GROUP XI. SUB-BELLARDIANI. See pp. 5, 73.²

1. Hairs on st. and pan.-rach. dense and fairly long, usually patent. L. mostly 5-nate.

a. Sep. normally reflexed, though often partially patent (or even erect) in frt.

R. fuscus Wh. & N. Prk. rather short, somewhat scattered. Lts. coarsely toothed, softly hairy beneath; term. rather broad with long point. Pan. narrow, cylindrical, with sunken stkd. gl. and acic.

Var. *nutans* Rogers. Prk. usually more unequal. Lts. more deeply incised, with very attenuate point. Pan. very lax, subracemose above, drooping. Frt.-sep. usually erect at first. (This var. would hardly be out of place in Section 2.)

Var. *macrostachys* (P. J. Muell.). Prk. longer. Lts. whitish-felted beneath. Pan. conspicuously pyramidal, with divaricate branches and blackish-purple villous rach. Stam. comparatively short.

b. Frt.-sep. mostly erect, p. 74.

Subsp. *obscurus* Kalt. Chief prk. hooked or nearly so. Prklets acic. and stkd. gl. mostly very small. Lts. even-toothed. Pan. long, with deep red pet. and short stam.

2. Hairs on st. abundant, rather short, loose or partly appressed. L. 5-nate or 3-4-nate. Sep. erect or patent on unripe frt., often reflexed ultimately.

a. L. mostly 5-nate, p. 74.

R. pallidus Wh. & N. Prk. usually confined to angles, mostly subequal. Lts. thin, very irregularly toothed, long and rather narrow. Pan. straggling-pyramidal, with wavy rach. slender ped. and mostly short blackish stkd. gl.

Var. nov. *leptopetalus*. St. most densely clothed with very short acic. and stkd. gl. Lts. with somewhat glaucous tint and sharply incised teeth. Pan. normally broad, with interlacing branches. Pet. small, very narrow.

b. L. 3-4-nate, rarely 5-nate, p. 75.

R. scaber Wh. & N. St. roundish, glaucous, rough with minute acic. Prk. small. Lts. with fine teeth and rather short point. Pan. narrow, with short hair and mostly short stkd. gl.

R. thyrsiger Bab. Hairs on st. partly appressed. Lts. coarsely irregularly toothed, obtusangular-obovate. Pan. long, subracemose, with long-pedicelled fl.

3. Hairs on st. rather thinly scattered or nearly absent. L. mainly 3-nate.

a. Sep. clasping young frt., mostly reflexed ultimately, p. 76.

R. Lintoni Focke. St. usually subglabrous. Prk. very slender. Lts. shining, with close fine teeth. Pan. cylindrical, racemose-corymbose, with very unequal stkd. gl.

R. longithyrsiger Bab. Prk. short. Lts. with shallow even teeth, obovate-cuspidate. Pan. pyramidal, racemose or subracemose above; ped. rigid, purplish with short stkd. gl. Carp. pubescent-glabrescent.

botryeros var. nov. St. conspicuously glaucous. Prk. and other arms more unequal. L. rather more frequently 4-5-nate. Lts. truncate-mucronate, more narrowed towards base. Pan. more composite, with larger fl. less rigid ped. and hairy carp.

b. Frt.-sep. normally reflexed throughout, p. 78.

R. foliosus Wh. & N. Prk. many weak subequal. Lts. nearly uniform, usually broadest near middle. Pan. long and narrow, with flexuous rach. and short few-flowered and often fasciculate branches.

GROUP XII. KOEHLERIANI (*Hystrices* Focke). See pp. 6, 78.

1. Prk. somewhat scattered, but chiefly on angles. Prk. and acic. rarely glandtipped. Intermediate arms only fairly many.

a. Prk. not very unequal, all of moderate length (except occasionally in *R. hostilis*). Stkd. gl. on rach. rarely very long.

R. rosaceus Wh. & N. St. roundish, pubescent or subglabrous. Prk. rather short. L. chiefly 3-nate. Lts. broad, hairy on nerves beneath; lat. very gibbous. Pan. broad. Pet. bright pink.

Var. *hystrix* (Wh. & N.). St. angular, more hairy, with stronger more unequal armature. L. often 5-nate. Lts. narrow, pubescent beneath. Pan. narrow. Sep. more erect. Pet. pink or pinkish.

Var. *infecundus* Rogers. Armature nearly Radulan. L. often 5-nate. Lts. yellowish, very softly hairy beneath. Pan. lax, pyramidal. Sep. rising early and clasping poor frt.

Subsp. *Purchasianus* Rogers. St. roundish, densely hairy. Prk. crowded, stout-based. L. mostly 5-nate-pedate. Lts. narrow, strigose on both sides. Pan. nearly cylindrical. Sep. shaggy, erect in frt.

Subsp. *adornatus* P. J. Muell. St. bluntly angled, pubescent, glaucous. Prk. very strongly declining. L. chiefly 4-5-nate. Term. lt. narrowed very evenly to long point. Pan. very narrow, wavy below. Sep. soon erect.

Subsp. *Powellii* Rogers. Slender. L. small. Lts. very narrow, with long attenuate point and compound incised teeth. Stkd. gl. very unequal: other glandtipped organs usually absent. Pan. very compound, lax, corymbose. Sep. strongly reflexed in fl. and frt.

R. hostilis Muell. & Wirtg. St. bluntly angled. L. chiefly 5-nate, often large. Lts. narrow, with irregular partially compound teeth and very long point. Pan. mostly short and racemose above. Frt.-sep. attenuate, clasping.

b. Prk. extremely unequal, some very long. Stkd. gl. on rach. passing into glandtipped acic. P. 82.

R. fusco-ater Weihe. Stout and very hairy. L. moderate. Lts. typically roundish-ovate with sharp point, not deeply incised. Armature very strong. Frt.-sep. erect or patent.

2. Prk. acic. bristles and intermediate organs of all kinds very numerous, very unequal, indiscriminately scattered and not unfrequently glandtipped.

a. Pet. white, p. 82.

R. Koehleri Wh. & N. Armature remarkably unequal, mostly slender,

often glandtipped. Lt.-toothing rather coarse. Pan. open, slightly narrowed above. Frt.-sep. reflexed.

Var. *cognatus* (N. E. Brown). Intermediate arms often less numerous. Leaf-toothing almost lobate-sinuate. Pan. broad and much branched. Frt.-sep. at first subpatent.

b. Pet. pink, p. 83.

Subsp. *dasyphyllus* Rogers. Intermediate arms present in very varying quantity. Lts. thick; teeth compound, partly recurved. Pan. very narrow, interrupted. Frt.-sep. reflexed.

R. plinthostylus Genev. Armature rather sub-Koehlerian. Lts. long, narrowed at both ends, very pale beneath. Pan. large. Frt. small. Frt.-sep. loosely reflexed or subpatent.

R. Marshalli Focke & Rogers. Hairy. Armature exceedingly dense and unequal, almost wholly patent. L. small. Pan. very elongate, with very long lower branches. Sep. subpatent in young frt.

Var. *semiglaber* Rogers. Subglabrous. Armature less uniformly patent and not quite so unequal. Pan. broader. Fl. more showy. Frt.-sep. often clasping.

GROUP XIII. BELLARDIANI (*Glandulosi* Focke). See pp. 6, 85.

1. Stkd. gl. on pan. conspicuously unequal, often twice as long as diameter of ped. Glandtipped bristles often numerous.

a. Frt.-sep. normally erect or patent (sometimes loosely reflexed in *R. Durotrigum*).

(i.) L. chiefly 5-nate.

R. viridis Kalt. Prk. and prklets fairly many, large-based. Lts. softly hairy and subglabrescent beneath, with irregular shallow teeth. Stam. far exceeding sty. Young carp. pubescent.

R. Durotrigum R. P. Murr. Prk. very crowded, slender, long-based. Lts. very slightly hairy on veins beneath, with deeply incised or lobate teeth. Stam. and sty. subequal. Young carp. thinly hairy.

(ii.) L. chiefly or wholly 3-nate, p. 86.

R. divexiramus P. J. Muell. L. mostly 3-nate. Lts. soft with short hair beneath, with fine closely placed compound teeth; lat. very gibbous. Stam. exceeding sty. Young carp. somewhat pubescent.

R. Bellardii Wh. & N. Prk. acicular, conical. L. 3-nate. Lts. subequal, evenly toothed. Pan. short, racemose above, with long thin ped. Stam. and sty. subequal. Young carp. glabrous.

(**R. flaccidifolius** P. J. Muell.) See below under *R. hirtus*. P. 89.

(iii.) L. 3-5-nate, p. 87.

R. serpens Weihe. Prk. short. Lts. unequal, irregularly toothed. Pan. narrow, racemose; sometimes with long racemose branches below. Stam. hardly exceeding sty. Young carp. glabrous.

R. hirtus W. & K. Prk. usually straight, setaceous. L. rarely 4-5-nate. Lts. broad, coarsely toothed, very hairy on veins beneath. Stam. rather exceeding sty. Carp. hairy. Densely glandular and bristly.

Var. *rotundifolius* Bab. Prk. and prklets mostly short, stout-based. Lts. with shallow teeth, subglabrescent beneath. Ped. long, divaricate. Stam. far exceeding sty. Carp. glabrous. Very luxuriant; with yellowish-brown tint.

b. Frt.-sep. reflexed or partly subpatent; occasionally erect, p. 88.

Subsp. *Kaltenbachii* (Metsch.). Prk. strongly declining, stout-based. Lts. narrow, irregularly toothed. Pan. elongate, pyramidal, drooping. Stam. exceeding sty. Carp. glabrous.

Subsp. *flaccidifolius* (P. J. Muell.). L. chiefly or wholly 3-nate. Lts.

subequal, thin, oval, long-pointed. Pan. narrow, lax, wavy. Sep. strongly reflexed in fl. and frt. Stam. unequal.

Subsp. *rubiginosus* (P. J. Muell.). St. and prk. stouter. Lts. thick, with somewhat patent teeth. Pan. narrow, cylindrical. Frt.-sep. loosely reflexed. Stam. usually exceeding sty. Carp. glabrous.

R. horridicaulis P. J. Muell. St. stout. Prk. many, strong. Lts. large, roundish-obovate-mucronate, with broad coarse teeth. Pan. strongly armed and very glandular. See under *R. saxiculus*, p. 91.

2. Stkd. gl. on pan. almost without exception shorter than diameter of ped. Glandtipped bristles few or none. (Near Group XI.)

a. Frt.-sep. chiefly patent, p. 90.

R. acutifrons A. Ley. Prk. strongly declining or hooked. L. 3-5-nate. Lts. thinly hairy beneath, with fine somewhat lobate teeth. Pan. very lax, with aggregated ped. Stam. far exceeding sty. Young carp. hairy.

R. saxiculus P. J. Muell. St. angular, subglabrous. L. mostly 5-nate. Lts. with soft short hair beneath, somewhat obovate with short point. Pan. long, with dense patent hair and short glandtipped organs.

R. tereticaulis P. J. Muell. St. densely hairy and aciculate. Prk. slender. Term. lt. obovate-acuminate, rather narrow. Stam. about equalling sty. Carp. glabrous.

b. Frt.-sep. reflexed in fl. and frt., p. 91.

R. ochrodermis A. Ley. St. stout, very prickly, subglabrous, ochreous. Term. lt. roundish-obovate-mucronate. Stam. exceeding sty.

c. Sep. clasping and almost hiding frt., p. 92.

R. velatus Lefv. St. with scattered silky hairs. Prk. stout-based. Term. lt. roundish-obovate-acuminate. Stam. exceeding sty. Carp. pubescent.

GROUP XIV. CÆSII. See pp. 6, 19.

1. L. 5-nate or 3-4-nate. Stip. linear-lanceolate or filiform (rather broadly lanceolate, in *R. Balfourianus*). Drupelets fairly many, rather large, mostly epruinoise.

R. dumetorum Wh. & N. *Sp. collect.* St. and pan.-rach. with many unequal prk. acic. and glandtipped organs. Lts. usually thick. Pan. mostly long, regular, compound, with rach. usually very hairy. Frt.-sep. mostly erect or subpatent.

(For conspectus of *R. dumetorum* forms see below, at the end of this table.)

R. corylifolius Sm. *Sp. collect.* Prk. subequal, irregularly scattered. Glandtipped organs very few. Lts. moderately thick. Pan. somewhat irregular, with few axillary branches and whitish-felted rach. Frt.-sep. normally reflexed.

a. Var. *sublustris* Lees. St. round. Prk. subulate. L. 5-7-nate. Term. lt. broadly ovate-acuminate incised-serrate and (often) lobate.

b. Var. *cyclophyllus* (Lindeb.). St. bluntly angled. Prk. rather short and stout. L. 5-nate. Term. lt. roundish cuspidate-acuminate, not lobate.

R. Balfourianus Blox. Stkd. gl. mostly short, fairly many though unequally scattered. Lts. usually thin, conspicuously wrinkled above. Stip. rather broad. Pan. diffuse, with straggling few-flowered branches. Frt.-sep. clasping. Fl. and frt. large.

2. L. normally 3-nate. Stip. considerably broadened in middle. Drupelets few, very large, conspicuously glaucous. P. 91.

R. cæsius Linn. Prk. weak short subulate. Stkd. gl. and acic. seldom many, sometimes absent. Lts. thin. Pan. lax, few-flowered. Frt.-sep. clasping. Whole plant weak.

CONSPECTUS OF *R. DUMETORUM* FORMS.

I. Frt.-sep. partly erect. Stkd. gl. on pan. considerably unequal, partly exceeding hairs.

(1) L. chiefly 5-nate.

a. Var. *ferox* Weihe. Prk. very crowded, mostly long patent. Lts. somewhat roundish. Pan. rather compact, with rounded top and straight rach. P. 93.

c. Var. *diversifolius* (Lindl.). Prk. very unequal, ranging from very strong ones to prklets and tubercles. Lts. chiefly oval or obovate. Pan. long, leafy, with very narrow top and very short subracemose branches. Strong. P. 93.

e. Var. *ruberiflorus* Purchas. St. slender, very glaucous. Prk. small, chiefly on angles. Pan. straggling, with one or more divaricate many-flowered branches. Pet. rather narrow, purplish. Usually large weak bushes. P. 94.

(2) L. chiefly 3-4-nate.

(i.) Acic. and stkd. gl. abundant.

b. Var. *britannicus* (Rogers). Prk. often crowded, usually short weak and partly somewhat falcate. Lts. roundish. Pan. much interrupted, with truncate top wavy rach. and lower branches like small secondary pan. P. 93.

d. Var. *pilosus* Wh. & N. St. and pan.-rach. considerably hairy. Prk. many, rather weak. Pan. leafy nearly to top, cylindrical, with long peduncled branches. P. 94.

(ii.) Acic. and stkd. gl. comparatively few.

f. Var. *tuberculatus* (Bab.). St. stout. Prk. and prklets very stout-based. Pan. open, cylindrical, with corymbose top. Pet. rather deep pink. P. 94.

g. Var. *concinnus* Warren. St. rather slender. Prk. broad-based, mostly patent. L. rather small and neat. Pan. elongate, with narrow subracemose top and long distant racemose lower branches. Pet. rather small, pinkish. P. 95.

II. Frt.-sep. reflexed. Stkd. gl. on pan. short, sunken.

h. Var. *fasciculatus* (P. J. Muell.). St. dark purple, with thinly scattered prklets. L. mostly 5-nate. Lts. with large incised compound teeth. Pan. narrow, with short stkd. gl. sunken in patent hair. P. 95.

GROUP I. SUBERECTI. See pp. 3, 7.

SECT. I. Prk. subulate or conical. L. often 6-7-nate. Frt. dark red.
(*R. nessensis* Hall.)

2. *R. fissus* Lindl. *Syn. Brit. Fl.* ed. ii. 92 (1835). *R. plicatus* Leighton. Prk. many, slender, subulate. L. plicate, thick, rather dark green above, conspicuously hairy beneath. Bas. lts. sessile. Pan. small, usually racemose. Frt.-sep. patent or erect. Stam. and sty. about equal. Young carp. usually somewhat hairy.

Set. No. 26. Fairly general and usually abundant where it occurs. Chiefly in sunny spots, and there only quite characteristic; becoming more like *R. suberectus* in damp shady places.

V.C. in G. Britain 45 [9]. Irish Co. 4.¹

N. Germany (rare)! Denmark. Scandinavia.

Comparatively short and small. St. bluntly angular or roundish. Prk. with small base, irregularly scattered. Petiole deeply furrowed. Lts. crowded, often imbricate; term. with moderate acuminate point. Pet.

¹ For detailed account of distribution in the British Isles see Appendix, p. 99.

white, usually small. Flowers early, but not so early as *R. suberectus*. These two species seem to be our only 'blackberries' with *dark red* (*not* black) ripe fruit.

3. *R. suberectus* Anders. *Trans. Linn. Soc.* xi. 218 (1815); not of Baer nor of Hooker. *R. fastigiatus*, *Rub. Germ.* 16 t. 23 (in part). *Prk. conical*, mostly short, with long compressed base, *few* (sometimes wanting). *L. plane*, thin, shining and *subglabrous*, pale green, with rather even and nearly simple teeth. *Bas. lts. subsessile*. *Pan.* and *fl.* variable in size, usually racemose and showy. *Frt.-sep. patent*. *Stam. exceeding sty.* Young carp. glabrous or thinly hairy.

Set, No. 52. Widely but rather thinly distributed. Mostly in wet thickets; distinctly preferring a light moist soil and moderate shade.

V.C. in G. Britain 40 [19]. Irish Co. 1 [4].

N. and Mid. Europe, widely dispersed. Brittany!

Tall, large. St. sharply angled, with prk. confined to the angles. Petiole obscurely furrowed towards its base. Lts. very gradually acuminate, not imbricate. Pet. white when fully open, though often red outside in bud. Dr. Focke says (*Syn. R. G.* p. 20) that this flowers first of the *Suberecti*, and that the only species which flower earlier still are *R. cæsius* and *R. dumetorum* (in some of its forms). In England *R. Balfourianus* seems amongst the first, and in most neighbourhoods probably the *Cæsius* generally precede all the *Suberecti*.

SECT. II. Prk. compressed, long-based. L. very rarely 6-7-nate
(except in *R. Rogersii*). Frt. black.

4. *R. Rogersii* Linton in *Journ. Bot.* 1894, 213, 214. St. nearly or quite glabrous, with crowded stout-based prk. (patent or declining), numerous sessile and a few subsessile glands and dark purplish pruinose tint in exposure. L. rather small, frequently 6-nate, rarely 7-nate, nearly plane, with remarkably close, fine, even teeth and long, very prickly, purplish petioles. Lts. greyish-green, strigose above, very pale and softly felted beneath; bas. subsessile; term. ovate-acuminate-cordate, with long gradually tapering point, and stalk about $\frac{1}{3}$ its length. Pan. with several simple ovate-acuminate grey-felted l. above, and crowded stout-based and chiefly falcate prk. on rach. and ped., racemose or subracemose, short and truncate at first, often prolonged with distant alternate fl. later and racemose branches below. Stam. slightly exceeding the greenish sty. when the fl. are wide open. Frt.-sep. loosely reflexed. Young carp. hairy.

Set, No. 76. On heaths, moors, etc., in sunny places, where it occurs with *R. fissus* and *R. plicatus*, but keeps quite distinct and constant in character. Widely distributed. In Scotland locally most abundant, and apparently at least as common as any other of the *Suberecti*.

V.C. in G. Britain 16 [1]. Irish Co. 2. Endemic?

Often strong in growth and rather tall, but with small and remarkably neat l., which recall those of *R. suberectus* in outline, though they are usually narrower, longer pointed, and far more hairy and greyish. Pet. white or pinkish, obovate or oval, of medium size. First observed by me in S. Devon in 1881, and then left unnamed as apparently distinct from all known suberect forms.

5. *R. sulcatus* Vest ex *Tratt. Ros.* iii. 42 (1823); not of Koehler. *R. fastigiatus* Wh. & N. *R. affinis* Fr. (and of many authors). *R. præcox* A. Kern. St. normally furrowed throughout. Prk. strong, rather few. L. all 5-nate. Lts. large, wide apart; bas. stalked; term. long-pointed and long-stalked. Pan. elongate, lax, handsome, usually racemose. Frt.-sep. reflexed (sometimes only loosely). Frt. remarkably long. Carp. glabrous. Luxuriant.

Set. No. 2. Apparently rather local. Wood borders, etc.

V.C. in G. Britain 6 [4].

Widely spread in Europe.

Large in all its parts. St. when weak or shade-grown only sharply angled, not furrowed. L. light green, hairy on nerves beneath and sometimes greyish when young; stalk of term. lt. often nearly $\frac{1}{2}$ its length. Fl. long-stalked. Pet. white. Stam. at first exceeding sty., but soon shrinking and drying up.

6. *R. plicatus* Wh. & N. *Rub. Germ.* 15 t. 1 (1822); not of C. A. Meyer. *R. corylifolius*, *affinis* or *nitidus* of many authors. St. very rarely rooting. Prk. fairly numerous, *falcate* or declining. Lts. *plicate*, *coarsely toothed*, green and hairy on both sides, paler and softly hairy or even felted beneath; *bas. subsessile*; *term. broadly cordate-ovate, with rather short point* and stalk usually less than $\frac{1}{3}$ its length. Pan. *racemose-corymbose*, either nearly unarmed or with prk. as on st. Stam. and sty. *subequal*, the sty. *usually exceeding*. Frt.-sep. patent. Young carp. glabrous or thinly hairy.

Set. No. 134. On heaths and moors, especially in light sandy soil. Generally distributed. In woods and on very poor soil distinguished with difficulty from its allies.

V.C. in G. Britain 55 [17]. Irish Co. 6 [2].

In W. Europe, from S. Scandinavia to N. France. In Switzerland and Tyrol a mountain species.

St. rooting occasionally in rich moist soil, but remaining nearly erect when the soil is poor and dry. L. rarely somewhat greyish beneath. Pet. medium-sized or large, white or pink; in the *R. rosulatus* P. J. Muell. bright red. In the typical plant the stam. are conspicuously short, as in *R. Selmeri* Lindeb. Cal. unarmed.

Var. *Bertramii* G. Braun ex Focke, *Syn. R. G.* 117. *R. opacus* Bertram (not of Focke). *Term. lt. rounder, with stalk usually more than $\frac{1}{3}$ its length; bas. shortly but distinctly stalked.* Pet. large, white. Stam. exceeding sty., often very long. *Luxuriant*.

Not in Set. Apparently far from uncommon, though not always easily distinguished from forms of *R. nitidus* and *R. sulcatus*, unless we restrict the name *Bertramii*, as Dr. Focke seems to do, to plants which have 'term. lt. broad, almost rotund,' as well as long stam. and distinctly stalked bas. lts.

V.C. in England and Wales 11.

Brussels. Brittany.

Var. *hemistemon* (P. J. Muell.) ex Genev. in *Mém. Soc. Acad. M. & L.* xxiv. 314 (1868). L. more hairy and paler than in typical *plicatus*, hardly plicate, *irregularly dentate*. Lts. oval, acuminate; basal stalked. Ped. more hairy and so greyer. Stam. shorter than the greenish sty., often considerably so at first. Frt.-sep. erect. Prk. rather unequal.

Not in Set. Apparently scarce, but connected with type by intermediate forms.

V.C. in G. Britain 9 [5]. Irish Co. 1 [1]. France.

GROUP II. SUBRHAMNIFOLII. See pp. 3, 7.

SECT. I. St. suberect, sometimes rooting. Sep. externally olive or greyish.

a. Sep. externally olive, with conspicuous white margin.

(i.) Frt.-sep. patent or subpatent. Pan. subracemose above. Pet. obovate or oval.

7. *R. nitidus* Wh. & N. *Rub. Germ.* 19 t. 4 (1822); not of Bell Salter, nor of Genevier, Kaltenbach nor Rafinesque. *R. plicatus* Blox. (in part.)

R. divaricatus P. J. Muell. St. glabrous, often rooting. *Prk. many rather long, slender, nearly straight or falcate, unequally scattered.* Adult l. plane, small, 5-nate-digitate, with hooked prk. (few or many) on petiole and petiolules. *Lts. bright green, shining above, thinly hairy on prominent yellowish nerves beneath, with wavy irregular toothing; term. oval-oblong acute; bas. shortly stalked.* Pan. usually very floriferous, rather broad and compound, with patent branches hooked prk. and rather small cuplike fl. Sep. green or olive usually patent throughout, sometimes erect in frt. Stam. exceeding sty., in most cases considerably. Carp. glabrous.

Set. No. 3. Chiefly in rather moist ground, on heaths, in thickets and by streams. So far as yet known, only thinly distributed.

V.C. in G. Britain 20 [4]. Irish Co. 2.

Sweden. Denmark. W. Germany! France.

The typical plant, with its strongly hooked prk. and small bright green l., can hardly be confused with others. This, Dr. Focke tells us, must be looked for chiefly on a loamy soil: the pan.-armature being weaker on sandy ground. Stip. usually narrow, linear. Cal. sometimes armed. Pet. oval, normally bright pink (white in *R. hamulosus* Lefv. & Muell., which Dr. Focke places under *R. nitidus* as = var. β . *albiflorus* Weihe). The plant referred to in *Journ. Bot.* 1890, 100 as probably *R. integrifolius* P. J. Muell. is much greyer in l. and sep., with weak armature and a narrow lax pan. Its description will be found below, p. 24.

Subsp. *opacus* Focke in *Alpers. verz. Gefpfl. Stad.* 25. Distinguished from *R. nitidus* by fewer prk.; lts. longer and usually larger, *opaque above, greyish-felted beneath* when young; term. lt. oval-cordate or subcordate and *gradually acuminate* and the rather *greyish-green hairy* sep. Bas. lts. distinctly stalked. St.-prk. declining, *with long slender point and rather short base.* Pan. racemose or subracemose-corymbose above, with term. subsessile fl., quite unarmed, or with few weak declining prk. Fl. cuplike; recalling those of *R. affinis*, but usually rather smaller. Pet. white. Stam. many, exceeding sty. Frt.-sep. subpatent, or sometimes erect. Carp. hairy at tip or glabrous.

Set. Nos. 78 and 106. On sandy soils and poor loam. Distribution little known as yet.

V.C. in England 5. [Scotland 1.] Irish Co. 1.

Denmark. N.-W. Germany! N.-E. France?

A fairly well-marked plant when furnished with the typical large term. lt. tapering gradually into the long point. But there is a frequent S. Devon form (No. 106 in Set),—found also by Dr. Focke near Bremen ‘on very poor and dry soil,’ and distinguished by him as ‘*forma minor*,’—which is smaller, with greyer more hairy and more finely toothed l. and an oval short-pointed term. lt. This small form somewhat recalls my var. *Briggsianus* (of *R. affinis*), though keeping quite distinct from it in its much shorter and more *nitidus*-like prk. and narrow subracemose-corymbose and nearly unarmed pan. with grey-felted rach., oval white pet. and subpatent frt.-sep.

(ii.) Frt.-sep. reflexed. Pan. with cymose branches. Pet. roundish.

8. *R. affinis* Wh. & N. *Rub. Germ.* 18 (1822); not of Bloxam nor of Babington. Incl. *R. relatus* F. Aresch. St. tall, at first erect, very bluntly angled, nearly or quite glabrous, often rooting. *Prk. normally very long and narrow, mostly patent.* L. 5-nate-digitate (rarely 6-7-nate), somewhat strigose above, paler beneath, often grey-felted when young. *Lts. with wavy sharply-serrate edge, often imbricate; bas. shortly stalked; term. ovate-cordate-acuminate, very gradually narrowed to the fine point.* Pan. with cymose branches and long slender prk. Fl. large, cuplike. Pet. roundish, abruptly clawed, pale pink. Sep. externally hairy,

usually olive and white-margined, sometimes greyish or wholly grey, reflexed. Stam. exceeding sty. Carp. glabrous.

Set. No. 5. Sandy commons, etc. Apparently rather rare except in S. England, where it is locally abundant.

V.C. in G. Britain 15 [6]. [Irish Co. 1.]

Sweden. N.-W. Germany!

Easily recognised by its marked prk., term. lt. and cymose-branched pan. with handsome cuplike fl. recalling those of *R. gratus*, though seldom quite so large. The term. lt. much resembles that of typical *R. opacus*, but it is broader at the base and more decidedly cordate, as well as usually thicker and more wavy-edged. Pan. not unfrequently leafy to the top, with lowest l. 5-nate and topmost simple. Dr. Focke's remarks, in *Syn. R. G.* 136, 137, on this species (formerly misunderstood by us in England) are especially helpful. As he points out in *Journ. Bot.* 1890, 101, the fig. in *R. G.* is poor and misleading.

Var. *Briggsianus* Rogers in *Journ. Bot.* 1894, 42. *R. affinis* Briggs, *Fl. Plym.* 111. St. lower and more arching from the first. Term. lt. oval-acute, usually with entire or at most slightly emarginate base, smaller. Pan. remarkably large and composite, less leafy above, with sep. rather less strongly reflexed.

Not in Set. Locally abundant in S.-W. England and Wales. V.C. in England and Wales 7.

Guernsey! Jersey!

Clearly, I think, a strongly marked var. of *R. affinis* with its characteristic prk., pan. and fl., though diverging from it in foliage towards *R. opacus* and *R. nitidus*. Dr. Focke prefers placing it under *R. nitidus*, but I cannot bring myself to agree with him.

b. Sep. externally greyish, less conspicuously white-margined, loosely reflexed or subpatent in frt.

9. *R. integrribasis* P. J. Muell.? ex *Genev. Mon. Rub.* ed. ii. 345. St. high-arching, glabrescent, rather light claret-red in exposure. Prk. declining from large base. L. mostly 5-nate-digitate. Lts. opaque greyish-green and subglabrous above, paler and thinly hairy beneath, with fine rather deeply incised toothing in the upper half; term. obovate or oval, with fairly long cuspidate-acuminate point, entire or emarginate base, and stalk nearly $\frac{1}{2}$ its length; bas. shortly stalked. Pan. very narrow, mostly simply racemose and lax, with weak declining prk. Fl. moderately cuplike. Sep. hairy and grey or greyish-green externally, subpatent or loosely reflexed in frt. Pet. crumpled, fugacious, broadly obovate, pinkish or very pale lilac. Outer stam. exceeding the faintly flesh-coloured prominent sty. Carp. glabrous.

Set. No. 4. Sandy commons and by streams, flowering early. Distribution little known. Abundant in S. Hants and Dorset.

V.C. in England 5 [2].

France.

The greyish tint of l. and sep. takes this plant some way from *R. nitidus* (with which Dr. Focke associates it) towards *R. pulcherrimus* and its allies; and yet in habit and pan. it recalls the true *Suberecti*. Though the st. is usually quite glabrous, its prk. are not unfrequently furnished with a few long hairs. In exceptionally strong plants the pan. develops racemose branches below, and the declining rachis-prk. become stouter and longer. The pinkish pet. show a tint of lilac. My description is drawn almost exclusively from Dorset and Hants plants. On Tooting Common, Surrey, I have seen bushes which seem identical with these. The Devon (N. and S.) plant I have only seen in frt. Both it and Major Wolley-Dod's Bickerton Hill (Cheshire) specimens seem rather different in their more oval and less greyish lts. The name *integrribasis*, suggested

by Dr. Focke as probably right in *Journ. Bot.* 1890, 100, is still only used provisionally. I have seen no continental spn. so named.

10. *R. cariensis* Rip. & Genev. in *Mon. Rub.* ed. ii. 265. *R. cariensis* Rip. & Genev. in *Mém. Soc. Acad.* xxviii. 55 (1872). St. high-arching, glabrous, furrowed above, *very dark purple*, with many sessile glands. Prk. long, rather unequal, mostly straight, but often with falcate ones intermixed. L. *very large*, 5-nate-digitate. Lts. not imbricate, strigose above, *ashy-felted* or *densely hairy* beneath, with crowded finely incised compound teeth; term. *oblong-oval-acuminate*, with subcordate or emarginate base and stalk usually less than $\frac{1}{3}$ its length; bas. shortly stalked. Pan. *very strong*, with *cylindrical ultra-axillary top* rather crowded mostly straightish prk. and clustered unequal hairs on rach. Sep. *ashy-felted*, aciculate, loosely reflexed in frt. Pet. whitish. Stam. unequal, partly exceeding green sty. Carp. glabrous or nearly so.

Set. No. 53. Locally abundant in the West, especially in N. Devon.

V.C. in W. England and Wales 8. Irish Co. 1.

France ('Maine et Loire, Gironde').

A very tall strong leafy plant looking intermediate between *R. affinis* Wh. & N. and *R. robustus* P. J. Muell. Lts. usually parallel-sided, occasionally somewhat obovate and with a few of the very finely pointed teeth patent. Fl.-shoot often enormous, with many of the lower l. 5-nate. In the fully developed pan. the lower branches are long few-flowered strongly ascending (as in *R. imbricatus* and *R. rhombifolius*) and usually very prickly. Sep. much greyer externally than in *R. affinis*. Bracts and ped. sometimes with a few very short stkd. gl.

SECT. II. St. soon arcuate, but seldom (if ever) rooting. L. *very large*.

Sep. externally grey or greyish-olive, mostly patent in frt. Bracts and sep. sometimes very finely gland-ciliate. Very strong plants, but with pan. normally racemose above.

11. *R. holerythros* Focke. *R. nitidus* Genev. (not of Weihe and Nees), *Ess. Mon.*, p. 311 (1869). St. suberect or arcuate, deeply striate, lustrous, slightly hairy. Prk. many, strong, mostly declining, with very compressed broad base. L. *very large*, 5-nate. Lts. *widespread with even crenate-mucronate teeth*, at first *very soft and pale* beneath, with close coat of white hairs; term. slightly obovate or oval-acuminate with emarginate base and stalk about $\frac{1}{3}$ its length, occasionally subrotund; bas. shortly stalked. Pan. when fully developed elongate and compound, *usually racemose above*, with *very showy long-pedicelled fl.*; rach.-prk. partly falcate, but chiefly declining. Bracts many, sometimes finely gland-ciliate. Sep. with long point, externally greyish-olive felted and hairy, usually patent in frt. Pet. *very large*, pink. Sty. and long stam. also *ultimately pink*, suggesting Dr. Focke's name. Frt. bright red, then glossy black. Carp. mostly glabrous.

Set. No. 77. Sandy commons and wood borders. So far known only in S. and Mid. England. Locally abundant.

V.C. in England 5.

France.

An exceedingly luxuriant handsome plant, growing in large clumps. St. erect at first, then with high arch bending to the ground, but apparently not rooting. Term. lt. usually a little narrowed below the middle to the subcordate or nearly entire base, though a broad oval outline is also frequent. Recalling *R. rhombifolius* Weihe in the great width of the l., due to the exceptional size of the intermediate lts., and in the pink floral organs; but differing from it in the longer more racemose ultra-axillary pan.-top, patent frt.-sep., and some other particulars.

12. *R. latifolius* Bab. *Man.* ed. iii. 94 (1851); not of Kuntze. St. soon

nearly prostrate, and thus abnormal in this group, slightly hairy, furrowed above. Prk. rather unequal, mostly short with long triangular base. L. very large, 5-nate-digitate. Its. all broad, with compound deeply incised toothing, rather harsh to the touch beneath, though with fairly close short hair; term. roundish-obovate, cordate-acuminate with stalk less than $\frac{1}{3}$ its length; bas. subsessile. Pan. truncate-cylindrical, narrow and quite racemose above, with long dense hair on rach., conspicuous deeply cleft reddish bracts, and lax racemose-corymbose branches below. Sep. externally grey with yellowish base, sometimes aciculate, usually patent or subpatent in frt. Stam. far exceeding sty. Young carp. considerably hairy.

Set. No. 107. Distribution little known.

V.C. in G. Britain 9. Endemic?

Strongly recalling *R. cariensis* and *R. holerythros*, but easily distinguished from both by its much lower growth, the harsher under-surface and coarser toothing of its broad lts. and the very different sep., which go off altogether from the suberect type, being densely clothed externally with a uniform coat of long grey or yellowish-grey hair. The broad reddish bracts and stip. are marked features. The pet. are bright pink in Anglesey, but apparently white in Linlithgow. Anomalous, and somewhat corylifolian in aspect, but on the whole apparently best placed here.

GROUP III. RHAMNIFOLII. See pp. 3, 8.

SECT. I. Term. lt. about thrice longer than its stalk; ovate, oval, or obovate (roundish-obovate-cordate in *R. imbricatus*).

a. L. chiefly 5-nate-digitate.

13. *R. imbricatus* Hort in *Ann. Nat. Hist. Ser. 2*, vii. 374 (1851). *Trans. Bot. Soc. Edin.* iv. 113 (1853). St. fairly high at first, soon prostrate, *remarkably branched*. Prk. usually short, declining. L. 5-nate. Its. usually imbricate, convex, wrinkled and strigose above, much paler with short hair beneath, with crowded compound incised finely pointed teeth; term. roundish-obovate, *cuspidate-acuminate, cordate*; bas. very shortly stalked or subsessile, *exceptionally small*. Pan. narrow, with distant, long, very strongly ascending lower branches and several 5-nate Pet. white or pink. Sep. abruptly cuspidate, reflexed in fl. and frt., uniformly grey and hairy. Carpels hairy-tipped or glabrous.

Set. No. 8. Wood borders, hedges, and open commons. S. and W. Britain, from Cornwall and Sussex to Berks and Hereford. Locally abundant, especially in hilly districts.

V.C. in Great Britain 13 [2].

W. France!

An easily recognised species admirably described in *Bab. Rub.* While in some respects strongly recalling *R. affinis* Wh. & N., it is far more rhamnifolian, and normally quite distinct in habit, prk., leaves, pan. and sep. St. with a fair amount of short crisp hair at first (extending to prk.) soon nearly bald, dull red. Pan.-rach. and ped. grey-felted, with short clustered hairs. Ripe frt. glossy black. Usually a rather slender plant and very constant in character; but there is an exceedingly luxuriant form abundant on some of the Surrey commons, which has long st.-prk. and an exceptionally showy pan. with bright pink pet.

14. *R. carpinifolius* Wh. & N. *Rub. Germ.* 36 t. 13 (excl. var. β); not of Lees, Bloxam, Boreau, nor J. and C. Presl. St. very long, arcuate-prostrate, rarely rooting. Prk. many, strong, patent or declining (occasionally with a few slightly falcate intermixed), yellowish. L. 5-

nate-digitate, rarely 6-7-nate. *Lts.* plicate, finely but somewhat irregularly serrate, soft beneath; *term.* long usually oval-acuminate, rarely ovate or slightly obovate; *bas.* shortly stalked. *Pan.* normally very prickly, leafy almost to the somewhat narrowed top, with erect-patent branches; not unfrequently subracemose or even racemose above. *Sep. patent in frt.*, often prickly at base. *Pet.* normally pure white, very rarely pinkish. *Stam.* far exceeding *sty.* *Frt.* large. *Carp.* glabrous.

Set. No. 28. Mostly on heaths, but also in hedges and wood borders. Widely, though apparently rather thinly spread through G. Britain. Exceedingly abundant on the Surrey commons south-west of London.

V.C. in G. Britain 32 [5]. Irish Co. 2 [5].

N.-W. Germany! Belgium? France!

Badly figured in Plate 13 of *Rub. Germ.*, as Dr. Focke has pointed out, and thus much misunderstood by us until recently. Whole plant usually pale and very prickly. Occasionally however the pan. is almost unarmed; or its prk., though numerous, become acicular. The leaf-tothing, though generally finely pointed and nearly simple, is sometimes unevenly compound, and rather coarsely incised. The typical plant, with its crowded yellowish prk., long oval pale-green plicate lts., pure white pet. and patent frt.-sep., is exceedingly well marked. In the herbarium however ill-developed forms often resemble *R. Lindleianus*. Plants also occur with pinkish pet. and l. grey-felted beneath, which, when just opening into fl., are not at once distinguishable from *R. incurvatus*. In both *R. carpinifolius* and *R. Lindleianus* the pet. are often nearly erect at first, but they are so narrowed towards the base as even then to form a much less cuplike fl. than in *R. rhamnifolius*; and ultimately the fl. becomes quite starlike.

A luxuriant bramble, with large lax pan., occurring in wet thickets in Herefordshire, is with great difficulty separated from *R. carpinifolius*. This was named *R. leucandrus* by Dr. Focke, and issued in the Set (11, b.) as a second form of that species.

15. ***R. incurvatus*** Bab. in *Ann. Nat. Hist.* Ser. 2, ii. 36. (1848). St. arcuate-prostrate, furrowed, rather hairy for this group. Prk. many, strong, triangular-based. L. 5-nate. Lts. remarkably concave, lobate-dentate, thick, shining above, very soft with greenish-grey felt beneath; *term.* broadly ovate or obovate, cordate, acuminate; *bas.* very shortly stalked. *Pan.* with long ultra-axillary top and short corymbose patent branches. *Sep.* clothed externally like under-surface of l., sometimes aciculate, rather loosely reflexed. *Pet., stam., and sty.* all pink. Young carpels usually hairy.

Set. No. 7. Hilly slopes, thickets, and heaths. As an aggregate species widely spread and locally abundant, especially in the West.

V.C. in G. Britain 32. Irish Co. 3.

Jersey: St. Aubin's Bay (I think a form of this)!

Not yet detected on the Continent.

The description given above is that of the typical plant as commonly found through N. Wales, and occurring in Co. Westmeath and Wexford and probably elsewhere in Ireland. Its l. are clothed beneath with a thick velvety felt, as in *R. pyramidalis* Kalt. Its pan. also somewhat recalls that of *R. pyramidalis*, though it is less leafy, more cylindrical above, and apparently always glandular. I cannot recall having seen this typical plant from any English or Scottish locality; but I have Derbyshire, Lancashire, and Salop specimens which hardly differ from it except in their laxer pan. with crowded strongly falcate prk. and their somewhat thinner and less lobate l.;—characters which suggest divergence from type towards *R. Colemanni*. In the usual S. England form the term. lt. becomes rounder with thinner whiter felt beneath, and the

laxer pan. more leafy above;—characters which, with some others, take it a considerable way towards *R. villicaulis*; but this form is connected with the type by the intermediate one which prevails throughout the Upper Wye Valley in Breconshire and Radnorshire (see *Journ. Bot.* 1899, 194), and which is also frequent on several of the Surrey commons.

16. **R. Lindleianus** Lees in *Phyt.* iii. 361 (1848). *R. nitidus* Bell Salt. (and of Leighton and Bloxam). *St.* high-arching, *lustrous*, fairly hairy when young, glabrous later. *Prk.* many, long, narrow, declining or patent, rarely a few falcate. *L.* 5-nate. *Lts.* rather thin, all usually *obovate-cuneate*, with entire base, *wavy-edged with irregular shallow teeth*, pale green shining and subglabrous above, softly hairy and paler with prominent nerves beneath. *Pan.* with *long and usually broad cylindrical-truncate top with rather long subequal, patent or divaricate cymose branches* and subsessile term. *fl.*; *rach.* and long *ped.* densely clothed with patent hairs and slender declining unequal *prk.*; not unfrequently a few stkd. *gl.*, mostly sunken, are also found. *Fl.* starlike. *Sep.* reflexed, reddening at base within. *Pet.* long-clawed, not contiguous, fugacious, normally pure white. *Stam.* many, much exceeding *sty.* *Inflorescence* usually nodding, often leafy to the top. *Frt.* and *drupelets small*.

Set. No. 29. Hedges, wood borders, etc. One of the few most generally distributed and best-known British and Irish brambles, though on the Continent apparently confined to some districts of Germany.

V.C. in G. Britain 74. Irish Co. 8.

N.-W. Germany ('Local, but in some places abundant'—Focke).

Sometimes mistaken for the less common *R. carpinifolius*, but, when fairly characteristic, easily distinguished from it and from all other species by the lustrous *st.*, very marked *l.* and cylindrical-truncate *pan.* with remarkably small *frt.* Usually the term. *lt.* (as well as the intermed. and *bas.*) is narrowed below the middle to an entire base; but it is sometimes ovate with emarginate base; and the Rev. H. W. Lett has sent me specimens from Aghaderg, Co. Down, with all the *lts.* on the *st.-l.* broad, and the term. one roundish-cordate.

b. *L.* 5-nate-pedate.

17. **R. erythrinus** Genev. in *Mém. Soc. Acad. M. & L.* xxiv. 196 (1868). *R. 'near Lindleianus'* T. R. Archer Briggs *Fl. Plym.* 112. *Journ. Bot.* 1890, 102, 103, 204-206. *R. argenteus* Wh. & N.? *St.* high-arching, with some very short thinly scattered clustered hairs, dark purplish-red. *Prk.* strong, rather *large based*, declining, purplish with yellow tip. *L.* 5-nate-pedate and 3-4-nate. *Lts.* somewhat convex, with wavy edge and irregular teeth, rather thick and *coriaceous*, bright green and thinly strigose above, softly hairy or *ashy-felted* beneath, with the dark purplish colour of the stem often extending to petiole, petiolule, and midrib; term. long-stalked, rather broadly obovate or truncate-obovate with long acuminate or cuspidate-acuminate point and cordate or emarginate base. *Pan.* lax, narrowing to the rounded ultra-axillary top, with long strongly ascending lower branches; rach. usually felted above, with many rather strong declining *prk.* *Fl.* somewhat cuplike. *Sep.* reflexed. *Pet.* oval, pink. *Stam.* exceeding *sty.* *Frt.* and *drupelets large*, abundant.

Set. No. 108; also some sheets of No. 6, but not those collected at Baillie Gate, Dorset, which, though labelled *R. erythrinus*, are really *R. Ques-tierii* Lefv. & Muell. Woods, hedges and open sunny places. Widely spread in S. and W. England and some of the Welsh counties.

V.C. in England and Wales 26. Irish Co. 3.

France! ?N.-W. Germany.

Though rather near *R. Lindleianus*, this species may usually be dis-

tinguished from it without difficulty by the lax interrupted pan. narrowing to the rounded top, the more coarsely toothed pedate l. and the large frt. The colour of st., l. and fl. is also quite different, and the leaf-edge less wavy. The normal British plant is usually eglandular, and in this agrees with numerous bushes of the species which I have seen in Brittany; but a plant occurring in considerable quantity on some open commons in Kent and Surrey, which must apparently be accepted as a strong form of *R. erythrinus*, has numerous acic. and stkd. gl. intermixed with the many long prk. on its very pyramidal leafy pan. In this form the l. are also as a rule more conspicuously ashy-felted beneath than in the type, from which however in other respects it seems to differ less than does the Somerset plant (No. 58 in Set of British Rubi), which Dr. Focke was at first disposed to name *R. argenteus* Wh. & N., and to place under *R. erythrinus*.

18. ***R. durescens*** W. R. Linton in *Journ. Bot.* 1892, 70, 71. St. arcuate, nearly glabrous, subpruinose, purplish. Prk. many, slightly declining, with moderate base. L. 5-nate-pedate, rather small. Lts. *coriaceous*, plicate, wrinkled, *brownish-green and glabrous above*, hard dull yellowish-green *with few short stiff hairs on the prominent nerves beneath*, with sinuate ciliate edge and *the larger teeth patent*; term. oval-acuminate and subcordate, occasionally ovate-cordate or slightly obovate. Pan. broad, rather short, *cylindrical-corymbose* with subsessile term. fl. and *patent cymose branches* with many broad 3-fid. bracts above, and few short patent-erect corymbose-cymose branches below; rach. thinly hairy, felted above, moderately prickly. Sep. greenish-grey, very hairy and sometimes aciculate externally, reddening within, loosely reflexed or subpatent in frt. Pet. obovate, light pink. Stam. pink, exceeding the sty. Carp. rather small, glabrous.

Set. No. 57. As yet found only in Mid. Derbyshire, where it occurs in considerable quantity. Endemic?

Although rather *subrhamnifolian* in aspect, this bramble is perhaps on the whole nearest to *R. Lindleianus*, especially in pan.; while in colour of st. petiole, etc., as in its pedate l., it recalls *R. erythrinus*. It seems however to keep quite distinct from all known species.

SECT. II. Term. lt. about twice as long as its stalk, roundish.

19. ***R. rhamnifolius*** Wh. & N. *Rub. Germ.* 22 t. 6; not of Billot nor of Wirtgen. *R. cardiophyllus* Lefv. & Muell. *R. cordifolius* Blox., and of many British authors. *Journ. Bot.* 1890, 101, 102; 1895, 345. St. arcuate, subglabrous, of a comparatively bright dark red. Prk. strong, mostly declining, rather large-based. L. 5-nate. Lts. *thick, coriaceous*, thinly strigose shining and dark green above, *ashy or whitish-felted beneath*, *with finely pointed teeth* which are *very close and nearly simple* in the average plant, but become loose and compound, and rarely rather coarse, on luxuriant bushes; term. *very long-stalked, roundish-ovate-cordate*, cuspidate or acuminate; petioles and petiolules strongly armed with hooked prk. Pan. *cylindrical*, with narrow blunt-topped ultra-axillary part, white-felted rach., strong declining prk. and often 2 or 3 ovate-acuminate simple l. Fl. *remarkably cuplike*. Sep. whitish-felted, reflexed. Pet. *roundish*, usually rather large, white or faintly pinkish. Stam. upright, exceeding sty. Carp. glabrous or with a few long hairs.

Set. No. 79. Hedges, wood borders, etc. Very generally, though sometimes rather thinly, distributed through England and Wales. Apparently somewhat less common in Scotland and Ireland.

V.C. in G. Britain 69. Irish Co. 8. Guernsey!

W. Europe, from Scandinavia! to Normandy! and Brittany!

The above description represents the ordinary British form, which seems far from uncommon on the Continent, and cannot, I think, be kept distinct from *R. cardiophyllus* Lefv. & Muell. In fact it agrees exactly with French specimens of M. Letendre's collecting which were issued as *cardiophyllus* (No. 414) by the *Association rubologique* in 1881, though in Mueller's description of that form, published in *Pollichia* (1859, pp. 86, 87), —as in Genevier's *Ess. Mon.* p. 216,—the leaf-toothing is represented as coarser than we find it, and Genevier moreover makes the stalk of the term. lt. 'nearly $\frac{1}{3}$ the length of the lt.', instead of (as it is with us) very nearly $\frac{1}{2}$, or rarely quite $\frac{1}{2}$ its length. The typical *R. rhamnifolius* of *Rub. Germ.* is described by Dr. Focke as having its l. glabrous above, and its prk. 'strikingly broad based'; but since he says in *Journ. Bot.* 1890, 101, that 'in every country and often in every province the *rhamnifolius* type has a somewhat modified appearance,' it seems best to retain Weihe and Nees' name in an aggregate sense for our plant, rather than substitute *R. cardiophyllus* for it.

Subsp. *Bakeri* F. A. Lees in *B. R. C. Rep.* for 1884 to 1886, p. 120. *E. B. ed. 3 Supp.*, pp. 78, 79. St. almost suberect, with fairly many scattered clustered hairs and occasionally some sessile and very shortly stkd. gl. Prk. often many, rather unequal and variable *mostly falcate*. Lts. as in *R. rhamnifolius*, but *very small*, with *longer points*, *much greener and less felted beneath*. Pan. broader, *very compound and floriferous*, usually with remarkably corymbose top and many long strongly ascending lower branches. Frt.-sep. loosely reflexed or subpatent. Pet. bright pink or pinkish, broadly obovate, with long claw. Stam. exceeding sty., sometimes only slightly at first. Carp. glabrous.

Not in Set. Open commons and slopes. Known in several English Co., in 2 Scottish and 1 Irish. Frequent on several of the Surrey heaths, S. of London.

V.C. in G. Britain 13. Co. Galway, Ireland! Endemic?

A very compact handsome bush. Described by Dr. Lees as 'a remarkably neat specialised form of *R. nitidus*' and considered by Prof. Babington to be *R. hamulosus* Lefv. & Muell.; but I agree with Mr. Baker in thinking that its closest affinity is with *R. rhamnifolius*, from some small forms of which it seems to diverge towards *R. nemoralis* P. J. Muell., and *R. Selmeri* Lindeb. As Mr. Gelert has pointed out to me, it comes very near to Areschoug's description (in *some Obs. on Rub.* pp. 152, 153) of *R. villicaulis*, var. *alienus* S. Murbeck.

20. *R. nemoralis* P. J. Muell. in *Flora* xli. 139 (1858); not of Babington nor of Neuman. *R. umbrosus* of British authors (in part). *Journ. Bot.* 1894, 42. St. arcuate, glabrescent. Prk. rather short, stout-based, declining. L. large, 5-nate, flat or somewhat concave. Lts. *pale green on both sides*, nearly glabrous above, slightly paler with a few short hairs on the prominent nerves beneath; *rather finely evenly serrate*, usually with some teeth compound; term. roundish-obovate-cuspidate, long-stalked; bas. very shortly stalked, sometimes imbricate. Pan. *very lax*, pyramidal at first, with several simple floral l. above and *very long lower strongly ascending racemose-corymbose branches*; rach., ped. and sep. ashy-felted and hairy, with falcate or strongly declining prk. and many long-pointed 3-fid bracts. Sep. reflexed, often aciculate. Pet. obovate, pink, rather large. Stam. upright, exceeding sty.

Set. No. 56. Hedges and wood borders. From Cornwall and S. coast to Wilts and Hereford; local. Yorks. W. Perth.

V.C. in G. Britain 7. [Co. Down, Ireland.]

France. Alsace.

A very strong and handsome bramble, often with a little support growing to a great height. The narrowed base of term. lt. usually cordate,

when mature. The numerous foliaceous bracts (the topmost lanceolate) are a marked feature in the pan. As the season advances the lower pan.-branches are remarkably lengthened, sometimes becoming nearly level with the top. On the whole nearest to *R. rhamnifolius* and its close allies. Its affinity to *R. macrophyllus* seems more remote.

Var. *glabratu*s Bab. *Rub.* p. 154. *Journ. Bot.* 1886, 225; 1887, 330; 1894, 43. *Term. lt. with longer acuminate-cuspidate point.* Pan. very long, cylindrical, less leafy above, with long-pedicelled fl. and the ultra-axillary top and strongly reflexed attenuate sep. conspicuously whitish-felted; the lower branches scarcely (if at all) longer than the upper. Pet. narrow, small, pink.

Set, No. 34. Hedges and woods. Fairly abundant locally in several Welsh and English border counties. Stirling.

V.C. in G. Britain 8 [1]. Endemic?

Though it seems impossible to keep this form specifically distinct from *R. nemoralis*, it clearly goes one step from it towards *R. macrophyllus*.

Var. *Silurum* A. Ley in *Journ. Bot.* 1894, 142. Lts. concave or flat, light green, more irregularly toothed; *term. broader*, more gradually acuminate, subrotund or broadly oval. Pan. elongate, truly *pyramidal*, in great part ultra-axillary; rach. hardly felted, except at top; bracts often finely gland-ciliate. Fl. cuplike. Pet. large, roundish, pale lilac.

Set, No. 109. Hilly woods, slopes and riversides. W. England and Wales, from Gloucester to Lancashire. Locally common.

V.C. in England and Wales 11. Endemic?

A very handsome, well-marked, and exceedingly constant form. As compared with *R. nemoralis* and var. *glabratu*s, its foliage is yellowish-green, without intermixture of grey. See *Journ. Bot.*, 1899, 194.

21. *R. Scheutzii* Lindeb. in *Hb. Rub. Scand.* (1885). *R. thyrsoideus*, var. *virescens* Scheutz. *R. Lindebergii* P. J. Muell., var. *viridis* F. Aresch. *R. Muenteri* Marss. (in part). *Journ. Bot.* 1897, 44. St. shining, glabrous, pale brown or fuscous. Prk. many, strong, stout-based, chiefly patent, rarely declining or slightly falcate. L. 5-nate, bright green, with very prickly petioles and petiolules. Lts. all exceptionally broad, and thus sometimes imbricate in spite of the backward direction of the bas. ones, with even shallow teeth, slightly paler and rather soft beneath with short hair; *term. roundish, with very short cuspidate point, nearly or quite entire base and long stalk.* Pan. long, cylindrical, hardly narrowed to the somewhat truncate top, with crowded declining and falcate prk., large fl., long stam., large pale lilac pet. and greyish-green sep., which are loosely reflexed or subpatent in frt. Carp. glabrous.

Not in Set. Open stony places. Abundant in Mid. Scotland and apparently generally distributed in that country. In England and Wales thus far known only very locally.

V.C. in G. Britain 11.

W. Sweden! Very local.

In bushes forming large rather low circular masses. Remarkably prickly. Scotland seems the true home of this plant, though it may yet prove to be fairly well distributed in the British Isles. On the Continent, where it was first observed by Scheutz as early as 1871, it was only known (up to March, 1898) in its original locality in W. Sweden, 'viz. on the east coast near Oskardamn, where it grows rather abundantly in open, stony, bushy places' (F. W. C. Areschoug, quoted by O. Gelert in litt. Mar. 7, 1898). We are indebted to Dr. Focke for the suggestion of the name, and an authentic specimen, collected by Dr. A. Lund in July 1884 and kindly procured for me by Mr. Gelert, shows that the Swedish plant is essentially the same as ours, though still more prickly and with more of its prk. strongly falcate.

22. **R. dumnoniensis** Bab. in *Journ. Bot.* 1890, 338, 339. *St. stout, furrowed, dark purple, with fairly many short crisp hairs and crowded long straight slender prk.* L. large, 5-nate, with dark purple petioles and petiolules. Lts. flat, *dark green* and thinly strigose *above*, whitish-felted beneath, finely but somewhat doubly serrate; term. roundish-ovovate-acuminate, with emarginate or subcordate base; bas. shortly stalked; rarely imbricate. Pan. *large, pyramidal*, with rather long, erect-patent lower branches; rach. hairy, hardly felted, with long slender prk. and often a few sunken glands; *partial rach. and long ped. finely aciculate*; term. fl. with very short ped. Sep. greyish, with very narrow white margin, reddening at base within, reflexed. Pet. *large, roundish, milk white*. Stam. far exceeding sty. Young carp. hairy at tip.

Set. No. 27. Sandy places, among rocks by the coast, etc. Widely spread from W. Cornwall to S. Derbyshire and through several Scottish counties. Co. Wexford and Galway.

V.C. in G. Britain 28 [2]. Irish Co. 3 [1].

Guernsey! Sark! Jersey!

A strong stout plant, striking from its contrasted colours, crowded long prk., large pan. and very handsome white fl. Clearly very near to *R. rotundatus* P. J. Muell. (see *Journ. Bot.* 1890, 129), if, as Prof. Babington held, quite distinct from it. In prk. recalling *R. affinis* Wh. & N., but in other respects coming somewhat between *R. rhamnifolius* Wh. & N. and *R. incurvatus* Bab. In the Channel Islands, in addition to our ordinary British plant, there occurs in some quantity (both in Sark and Guernsey) a second form having lts. with lobate-serrate teeth and greenish-ashy felt beneath, and a term. lt. which is broadly ovate with gradually acuminate point and deeply cordate base.

SECT. III. St. hairy for this group. Lts. finely toothed; term. obovate-acuminate, long-stalked. Pan. very long.

23. **R. pulcherrimus** Neum. in *Oefvrs. Vet. Akad. Foerh. Stockh.* No. viii. 65 (1883); not of Hooker (v. *Journ. Bot.* 1890, 166). *R. polyanthemus* Lindeb. *R. Neumani* Focke. *R. umbrosus* of British authors (in part). *R. Maassii* Bab. (in part). *R. carpinifolius* Blox. (in part). St. arcuate-prostrate, *rather hairy, dull red or greenish*. Prk. many, patent or slightly declining. L. 5-7-nate. Lts. convex, coriaceous, *dull greyish-green* and strigose above, *greenish-ashy* felted beneath; term. rather broadly obovate-euspidate, with entire or emarginate base, *from 2½ to more than 3 times the length of its stalk*. Pan. *handsome, long, pyramidal with narrow ultra-axillary top, usually a fair number of stkd. gl. on rach. ped. and bracts, and slender declining prk.* Sep. reflexed. Pet. *broad, usually rather small and bright pink*. Stam. exceeding sty. Carp. usually glabrous.

Set. No. 54. Commons, wood borders, hedges, etc. One of our most generally distributed brambles, and usually abundant where it occurs.

V.C. in G. Britain 71. Irish Co. 8 [1].

Guernsey! Jersey! S. Sweden. Germany!

Placed by Areschoug among *Discolores*, and by Friderichsen and Gelert among *Egregii*, with which latter group extreme examples no doubt show some affinity. The chief constituent in our former '*R. umbrosus* Arrh.' Our common British plant, plainly identical with the Swedish and German *R. pulcherrimus*, is a very handsome bramble having marked l. (usually 5-nate, occasionally 6-nate, rarely 7-nate), a long narrow very floriferous pan., with a good many stkd. gl. and rather small bright pink pet.; but it seems best to include under it the closely allied plants frequently met with, which have white or faintly pinkish pet. and are nearly or quite eglandular, while in other respects hardly if at all distinguishable from

the type. Indeed I have seen no British bramble labelled '*R. Muenteri* Marss.' or '*R. Maassii* Focke' which I should not venture to call either *R. pulcherrimus* or *R. Lindebergii*. The highly glandular and aciculate plant referred to under *R. pulcherrimus* in *Journ. Bot.* 1891, 240, for a time known amongst us as var. *setosus*, and for which I suggested the name *R. cinerosus* in *B. E. C. Rep.* 1896, 513, will be found described below, immediately before *R. mucronatus* (p. 54), which on the whole seems its most natural place in our list.

24. ***R. Lindebergii*** P. J. Muell. in *Pollich.* xvi.-xvii. 292 (1859). *R. umbrosus* of British authors (in part). St. tall, arcuate-prostrate, pale. Prk. stout, mostly declining. L. all 5-nate. Lts. wide-apart, uniform, acuminate, narrowing a good deal below to entire or emarginate base, with very even nearly simple teeth, pale greyish-green and strigose above, grey-felted beneath; term. narrowly obovate, about twice the length of its stalk (not unfrequently less). Pan. narrow, eglandular, somewhat flexuose, with crowded strong and mostly falcate prk. and very short few-flowered branches. Fl. showy. Sep. reflexed. Pet. always white, large, obovate with long claw. Stam. white, far exceeding greenish sty. Carp. glabrous.

Set, No. 55. Dry, stony, open places and thickets, especially on limestone; in N. and W. England, locally abundant; extending into Scotland, but apparently absent or rare in S. England.

V.C. in G. Britain 21.

Scandinavia!

A striking and easily recognised bramble, which keeps quite distinct with us, as Mr. Areschoug says it does in Scandinavia. Whole plant pale, greyish. St. mostly furrowed. L. and pan. remarkably constant in character.

GROUP IV. VILLICAULES. See pp. 3, 9.

25. ***R. mercicus*** Bagnall in *Journ. Bot.* 1892, 372. '*R. ramosus* Blox.' (in part). St. 'erect-arcuate,' purplish and subpruinose, thinly hairy. Prk. many, usually strongly declining, rather unequal and scattered. L. 3-5-nate-pedate, 'flat or convex.' Lts. dark green and strigose above, paler and thinly hairy beneath, doubly and rather coarsely serrate; term. broadly oval or roundish, with short cuspidate-acuminate point and entire (or nearly entire) base, from $2\frac{1}{2}$ to 3 times the length of its stalk. Pan. lax, irregular, rather short, narrowing but little to the corymbose top; branches long, patent-erect; rach. and ped. purplish, clothed with long fine hair, unequal declining prk. and acic. and (rarely) a few stkd. gl., scarcely felted even at top. Sep. reflexed, reddening at base within. Pet. obovate, white or faintly pinkish. Stam. exceeding sty. and reddening like the sep. Frt. 'insipid.' Carp. glabrous.

Set, No. 31. 'Hedges.' At present known with certainty only between Water Orton and Minworth, Warwickshire.

V.C. in England 1. Endemic?

I have not seen living bushes and do not know the range of variation in this species, but Mr. Bagnall's specimens seem to represent a well-marked bramble, which is certainly distinct from the common Devon *R. ramosus*, with which it was for a time associated.

Subsp. ***bracteatus*** Bagnall in *Journ. Bot.* 1894, 187. '*R. ramosus* Blox.' (in part). L. greyer, with finer closer teeth; those on pan. usually ashy-felted beneath. Lts. obovate. Pan. very elongate, with remarkably pyramidal ultra-axillary top; rach. ped. and strongly reflexed sep. conspicuously grey-felted, usually with many sunken glands. Bracts many,

long, deeply 3-cleft, with 2 or more simple oval or 3-lobed l. between them and the 3-nate l.

Set. No. 110. Apparently rather widely spread in England;—plants which seem to belong here occurring in several counties from Sussex to Westmoreland. But I cannot be certain of their identity in every case.

V.C. in England 8 [1]. Endemic?

In its strikingly elongate pyramidal pan. resembling the far more glandular *R. Kaltenbachi* Metsch. In other respects it seems intermediate between *R. pulcherrimus* Neum. and *R. egregius* Focke. The Boar's Hill (Berks) form, with lts. greatly narrowed to base, is especially near to the latter, though less glandular and with rather greener l.

Subsp. *chrysoxylon* Rogers in Griffith, *Fl. Angl. & Curn.* p. 43 (1895). *St. less hairy, ochreous or fuscous. Prk. weaker* and still more scattered. *L. 3-5-nate. Lts. with finely incised compound teeth, obovate-cordate, with longer more cuspidate point. Pan. lax, more cylindrical-truncate, with rather long broad ultra-axillary part, acicular prk. thinly scattered stkd. gl. and subpatent frt.-sep.* The whole plant less hairy than either the type or subsp. *bracteatus*.

Not in Set. In woods and open places. As yet known only in N.-W. Carnarvonshire and Anglesey, but locally abundant.

V.C. in Wales 2. Endemic?

The connection of this form with *R. mercicus* was first suggested by Dr. Focke. It is however far less hairy and quite different in colour; and the subpatent frt.-sep., slender irregularly scattered prk. and somewhat truncate-obovate l. take it off from *mericus* towards *R. mucronatus* Blox.

26. *R. villicaulis* Koehl. in Wh. & N. *Rub. Germ.* 43, t. 17 (1825). *Journ. Bot.* 1897, 45. St. high-arching, hairy, with prominent angles, fuscous. Prk. many, long, patent or somewhat declining. L. 5-nate-digitate, or 3-5-nate, with exceptionally long petioles. Lts. thick, strigose above, very soft with long silky hairs or greenish-grey felt beneath, with fairly even and nearly simple teeth; term. broadly oval or more rarely obovate, acuminate, with rather long point and entire or subcordate base. Pan. long, leafy, rather dense above, very lax below, with cymose branches; rach. somewhat flexuose, villous-felted, with crowded strong declining and falcate prk. and conspicuous bracts; ped. also very prickly and hairy. Sep. strongly reflexed at first, more loosely in frt. Pet. obovate with long claw, pale pink or white. Stam. exceeding sty., often reddening. Frt. ovate. Carp. thinly hairy.

Set. No. 111. Open stony places, wood borders, etc. One of the most abundant of Scottish brambles; fairly frequent in W. England and Wales, from Cornwall to Carnarvonshire and Staffordshire.

V.C. in G. Britain 25 [3]. Irish Co. 1 [8].

Germany!

Recognisable generally by the many strong long straightish prk., shaggy rach. and ped., prickly cymose-branched pan. (lax below) and broad oval lts. with long soft hair beneath. The name *villicaulis* is suitable enough in our common Scottish form (more thinly distributed in England and Wales) which is identical with the Silesian plant originally thus named by Koehler. With this type Dr. Focke combines the Scandinavian *R. insularis* F. Aresch., which Messrs. Friderichsen and Gelert agree with its author in wishing to keep apart. It hardly differs from Koehler's plant, except in its less hairy and rather less prickly st. and the shorter hair and closer greyer felt on the under-surface of its l. The common *R. villicaulis* of N.-W. Germany is fairly like *R. insularis* in these particulars; but its lts. are usually more narrowed below and more irregularly

toothed, and its pan. laxer throughout, with straighter stouter prk. and more whitish felt on the rach. and ped. With it seems to agree the common Devon and E. Cornwall form. On the st. of the typical plant both prk. and hairs are remarkably long and closely placed, and the hairs very fine and pure white. Thus in *R. villicaulis*, as in *R. rhamnifolius*, the use of the name in an exceptionally aggregate sense seems quite unavoidable; but the three plants which here follow as subsp. under it seem both to need careful differentiation and readily to admit of it.

Subsp. *Selmeri* (Lindeb.), *Hb. Rub. Scand.* No. 33. *R. villicaulis* F. Aresch. *R. affinis* Blox. St. subglabrescent. Prk. stouter, shorter, often falcate. L. 5-nate, rarely 6-7-nate. Lts. concave, plicate, with wavy edge and compound finely pointed teeth, often becoming reddish-mottled, usually quite glabrous above, thinly hairy beneath, rarely with close pale felt; term. roundish-ovate. Pan. strong, more cylindrical, with broader more truncate top and many-flowered cymose branches below; rach. thinly hairy, not felted, with many strongly falcate or hooked prk. Fl. showy, starlike. Sep. usually reflexed throughout, though sometimes only loosely with young frt., red at base within. Pet. normally bright pink, occasionally paler. Stam. short, rarely exceeding sty., often barely equaling them. Frt. oblong. Carp. thinly hairy or pubescent.

Set. No. 80. Sandy and gravelly commons, wood borders, etc. One of the commonest British and Irish brambles, and usually exceedingly abundant where it occurs.

V.C. in G. Britain 55 [6]. Irish Co. 7. [1].

Norway! Germany (Holstein, Hanover).

When young (before the full development of the pan.), and when exceptionally large-flowered, recalling *R. gratus* Focke; but in its normal state not easily mistaken for that or any other British bramble. The whole plant is conspicuously more glabrous than *R. villicaulis*, with stronger and more showy pan. and rounder lts. shining and dark green above. It seems to diverge from it towards *R. Lindebergii* and *R. rhamnifolius*. It is certainly the *R. affinis* of Bloxam, though sometimes named by him (and by many of us after him) *R. calvatus*,—in common with the following distinct and less widely distributed subsp.

Subsp. *calvatus* Blox. in *Kirby*, 42 (1850). ‘*R. sylvaticus* Wh. & N.’ of Bloxam and Coleman before 1850. *R. Salteri*, *β. calvatus*, *Bab. Man.* ed. 5, 101; *Bab. Rub.* 133. St. furrowed, considerably hairy at first, then glabrescent. Prk. more irregularly scattered than in *R. villicaulis*, shorter, declining. L. large. Lts. convex, green on both sides, glabrous or subglabrous above, hard and very thinly hairy beneath, with large, compound, and partly patent or recurved teeth; term. oblong or oval, with rather short acuminate point and cordate base; petiole and petiolules very prickly. Pan. long, very lax, with simple ovate and 3-lobed floral l. above, and large 3-5-nate l. below, which greatly exceed the few-flowered branches; rach. somewhat flexuose, densely clothed with patent villous hairs and declining prk., hardly felted, sometimes aciculate and rather glandular. Frt.-sep. subpatent or even erect. Pet. white or pinkish. Stam. of moderate length, exceeding sty. Frt. oblong. Carp. glabrous or nearly so.

Set. No. 112. Bushy places, hedges, ‘old sand quarries.’ From Sussex to Derbyshire and Lancashire, local. So far unrecorded from S.-W. England, Wales and Scotland.

V.C. in England 10 [1]. Irish Co. [1]. Endemic?

Often very strong. Prk. many, usually all declining and comparatively weak, occasionally slightly falcate. Lowest pan.-branches racemose, those above cymose; the highest overtopping the term. fl. Long known as *R. Salteri*, var. *calvatus* Bab., the name given to it in *Bab. Man.* ed. 5,

but not accepted by Bloxam. Exceptionally glandular specimens of it were at one time named *R. melanoxyton* by Dr. Focke, but wrongly, as he has since admitted. While in some respects strongly recalling *R. curvidens* and shade-grown *R. anglosaxonicus*, it really seems intermediate between typical *R. villicaulis* and *R. Colemanni*.

Subsp. *rhombifolius* Weihe in *Boenn. Prod. Fl. Monast.* 151 (1824). *R. vulgaris* var. δ . *rhombifolius* Wh. & N. *Rub. Germ.* 38, 40. *R. carpinifolius* β . *roseus* Wh. & N. *Rub. Germ.* 36. St. thinly hairy, dark red. *Prk.* broad-based with fine point, declining, rarely slightly falcate. *L.* 5-nate, with strongly armed petiole and petiolules. *Lts.* in the mature *l.* wide apart, thin, all usually considerably and gradually narrowed at both ends, with long tip and double fine-pointed teeth, thinly strigose above, ashy- or greenish-felted with short hair beneath. *Pan.* lax, leafy, pyramidal, with slightly flexuose rach., falcate *prk.*, strongly reflexed whitish *sep.*, and the *pet. sty.* and long *stam.* all red (normally); the lower branches long and usually ascending at a very acute angle, the upper ones patent, 1-3-flowered, the bracts often gland-ciliate.

Set, No. 9. Open commons and thickets. From Somerset and Hants to Notts and Carnarvonshire. Apparently but thinly distributed in England, and rare in Wales, Scotland and Ireland.

V. C. in G. Britain 15 [2]. Irish Co. 2. Guernsey!

W. Germany!

I have ventured to place this as a subsp. under *R. villicaulis*, because when growing it looks very nearly intermediate between that species and subsp. *Selmeri*. When normal however, it may readily be distinguished from both by the thinner, narrower, more gradually acuminate rhomboidal lts. with shorter hair beneath, the pyramidal pan. with more strongly reflexed sep. and the bright red of the fl.-organs. The ashy-felted rhomboidal term. It. is seldom wanting when the plant is growing in sunny places; but in shade this It. is usually oval in outline and green beneath; and this shade form, Dr. Focke states, is the *R. carpinifolius* β . *roseus* Wh. & N. When specimens are gathered early in the season, before the fall of the pet. and full development of the pan., *R. holerythros* cannot always be readily distinguished from *R. rhombifolius*.

27. *R. gratus* Focke in *Alpers. Verz. Gefpfl. Stad.* 26 (1875). *R. vulgaris* Focke, *Beitr. 27. Journ. Bot.* 1877, 367. St. arcuate-prostrate, furrowed, very thinly hairy. *Prk.* rather short, declining, from broad base. *L.* large, 5-nate-digitate. *Lts.* broad, yellowish green, strigose above, paler and softly but rather thinly hairy beneath, very coarsely and irregularly biserrate; term. broadly obovate or ovate, with rather long cuspidate-acuminate point, entire or emarginate base, and stalk about $\frac{1}{3}$ its length. *Pan.* normally short, leafy, diffuse, with few-flowered patent-erect branches and large 3-nate l. passing into narrow simple ones at top; rach. thinly clothed with long hair and declining prk. *Fl.* very large. *Sep.* externally olive-grey with narrow white margin, erect in frt. *Pet.* pink, or with pink claw. *Stam.* far exceeding sty., often reddening; 'pollen grains large, all (or nearly all) equal, regular' (Focke). *Frt.* large, oblong. *Carp.* glabrous or slightly hairy at the tip.

Set, No. 10. From Cornwall and Kent to Lincoln and Lancashire; local. Fairly frequent in Wales and several Scottish counties.

V. C. in G. Britain 27 [1]. Irish Co. 1 [1].

N.-W. Germany! Belgium.

One of the three British Rubi (the others being *rusticanus* and *cæsius*) found to have 'quite regular pollen grains' by Dr. Focke, who also states that 'in length of stam. and frt. it surpasses every other German bramble,' while 'in size and form of fl. *R. Schlechtendalii* and *R. affinis* are nearest

to it.' Luxuriant bushes of *R. Selmeri* sometimes recall this species, but can be distinguished from it by rounder and more wavy-edged lvs., strong falcate prk. and cylindrical pan. with reflexed frt.-sep. and exceptionally short stam.

A nearly allied plant growing at Felin Hen near Bangor (Carnarv.) seems to be a strong form of the Schleswig-Holstein *R. sciaphilus* Lange, which Messrs. Friderichsen and Gelert consider to be intermediate between *R. gratus* and *R. silvaticus*, 'a plant of low ground, with pet. always white.' After examining a good series of spns. from Lyksborg, which I owe to the kindness of those batologists, I am inclined to place it as a rather hairy var. under *R. gratus*, with pan. more narrowed to the top, smaller fl., aciculate sep. rather subpatent than erect in frt., 5-nate-pedate l. and term. lt. more gradually acuminate. The Felin Hen plant has stronger prk. and rather less *gratus*-like sep. than those of the German form, but in other respects it seems practically identical, and Mr. Gelert agreed with me in thinking that it may be 'a very strong *R. sciaphilus*.'

28. *R. leucandrus* Focke in *Alpers. Verz. Gefpfl. Stad.* 27 (1875). St. arcuate-prostrate, blunt-angled, usually with few or a good many fine hairs (single and clustered). Prk. rather long, declining, from broad base. L. 5-nate. Lvs. imbricate, concave, softly hairy beneath, in form and dentition much like those of *R. gratus*, but usually more hairy, more gradually acuminate and with rather more even and more finely pointed teeth; term. ovate-cordate-acuminate, usually long-pointed (rarely with rather short point), with nearly entire base, and stalk $\frac{1}{3}$ to $\frac{2}{5}$ its length. Pan. irregularly branched, with felted ped. and conspicuous fl. Frt.-sep. reflexed. Pet. large, obovate, pure white, as are the stam., which far exceed the sty. Frt. large oval. Carp. glabrous.

Set. No. 11. Hedges, thickets and commons. From Cornwall and Hants to Herefordshire and Breconshire; local.

V. C. in England and Wales 9 [1].

N.-W. Germany!

Intermediate between *R. affinis* and *R. gratus*, but normally with more hairy st. and paler l. than either, and white fl. A somewhat difficult species with us, showing a considerable range of variation in l. and pan. The pure white stam. and pet. are very conspicuous. In its term. lt. it usually comes about midway between the two species named; while in pan. it is more irregular and variable. Dr. Focke now agrees with me in considering the *R. hirtifolius* of *Fl. Plym.* best placed (in an aggregate sense) under *R. leucandrus* (See *Journ. Bot.* 1895, 77). Its lvs. are exceptionally soft beneath and evenly toothed; but in other respects it seems indistinguishable from the form so abundant in the Bournemouth neighbourhood (Hants and Dorset) which Dr. Focke has thus named from the living bushes (*Journ. Bot.* 1890, 129).

On the Herefordshire plant issued in the Set (11 b.), on Dr. Focke's authority, as a form of *R. leucandrus*, see above (under *R. carpinifolius*), p. 27. For differences between this species and *R. carpinifolius* with other allied species, see *Syn. R. G.* p. 210.

(*R. hirtifolius* Muell. & Wirtg.) See below, p. 48.

(*R. Questierii* Lefv. & Muell.) See below, p. 45.

GROUP V. DISCOLORES. See pp. 3, 10.

SECT. I. St. erect-arcuate, rarely rooting, glabrous or very nearly so, furrowed.

29. *R. ramosus* Briggs in *Journ. Bot.* 1871, 330-332. *R. ramosus* Blox. Ms. (in part); not of Neuman (1883). St. erect-arcuate, furrowed, 'quite

glabrous, or with very few inconspicuous silky hairs.' *Prk.* few, large-based, patent or declining, rarely subfalcate. *L.* 3-5-nate-pedate, with remarkably long petiole. *Lts.* convex, coriaceous, shining and thinly strigose above, with few short and inconspicuous hairs beneath, but usually having close ashy or whitish felt under the hairs, coarsely and irregularly serrate; term. narrow, oblong or slightly obovate, with short cuspidate or cuspidate-acuminate point, subcordate base, and stalk often nearly $\frac{1}{2}$ its length. *Pan.* lax, loosely subpyramidal, with broad corymbose top and long lower branches; *rach.* somewhat flexuose and, with *ped.* and *sep.*, ashy- or whitish-felted and thinly hairy; *prk.* few, unequal, irregularly scattered, chiefly declining, partly falcate. *Sep.* loosely reflexed. *Pet.* roundish-oval, with very short claw, white or pinkish. *Stam.* white, slightly exceeding pinkish sty. *Frt.* indifferent and often imperfectly produced.

Set, No. 59. Rocky bushy places. Abundant through a great part of S. Devon; occurring also in E. and W. Cornwall. I have seen a spn. of Mr. Bloxam's from near Rugby, which I believe to belong to this species; but I learn from Mr. Bagnall that the plant has almost certainly disappeared from that, its solitary Warwickshire locality (see *Journ. Bot.* 1882, 102). Confirmation needed for other v.c.

V. C. in England 4 [5]. Endemic?

A large straggling plant with remarkably convex lts., which shine on the upper side as if varnished, and beneath are normally (like rach., ped. and sep.) ashy-felted. In this conspicuous *felt on pan.*, as in *shape* of lts., it recalls *R. Questierii* Lefv. & Muell., while differing from that species greatly in the looser longer branches of its eglandular pan. and the pale felt on under-surface of lts.

Though Mr. Briggs's description of *R. ramosus* (from Devon plants) was published in 1871, it was not till 1892 (see *Journ. Bot.* for that year, p. 372) that the very different *R. mercicus* was definitely separated from it. A form of *R. ramosus* is frequent in S. Devon which was thought by Mr. Briggs and Prof. Babington, and apparently with good reason, to come very near to *R. macrostemon* Focke. It has stronger prk. and more acuminate and rather more finely toothed lts., together with a much more compact and broadly pyramidal pan. than we find in the type. And not very different from this is another bramble sent by me in 1897 to Dr. Focke from Waterworks Valley, Jersey. He wrote of this '*R. macrostemon*, I think,' adding, 'in the common form the branches of the pan. and the ped. are short, and therefore the fl. much more crowded.' These forms however need further study before we can safely add *R. macrostemon* to our British list.

30. **R. thyrsoideus** Wimm. *Fl. Schles.* ed. i. p. 204 (1832); not of *Bab. Rub.* 108. *St.* strong, high-arching, furrowed, glabrous or glabrescent, rarely rooting. *Prk.* stout-based, straight or somewhat falcate. *L.* 5-nate-digitate. *Lts.* flat or concave with wavy edge, glabrous or nearly so above, with pale felt beneath, unequally serrate, usually with incised compound teeth; term. variable:—acute or acuminate, usually narrowed below when young, later narrowly ovate to broadly ovate, with stalk $\frac{2}{5}$ or nearly $\frac{1}{2}$ its length. *Pan.* long, the ultra-axillary part cylindrical, felted, weakly armed, with nearly patent cymose and 1-2-flowered branches; lower branches distant, more strongly armed with falcate and declining prk. *Fl.* showy. *Sep.* reflexed. *Pet.* white or light pink. *Stam.* exceeding sty. *Frt.* well developed. *Carp.* usually glabrous.

Set, No. 116. Rather widely, though apparently somewhat thinly, distributed through England and Wales. Not yet detected in Scotland (except perhaps in S. Aberdeen) or Ireland.

V.C. in England and Wales 14 [5].

Germany! (widely spread). France.

Tall striking plants with beautiful pan. and foliage. Prk. mostly straight on main st., but towards its top and on the branches more curved. Felt on under-surface of l. usually close and whitish, more rarely loose, soft and somewhat greenish. Treated as a *sp. collect.* by Dr. Focke (see *Syn. R. G.* 164-175). Our usual form is either his *R. thyrsanthus* or a plant near it,—with term. lt. (when mature) broadly oval or ovate and the pan.-branches shorter and closer together than in *R. candicans* Weihe, the other chief form on the Continent. The pan. is also rather more narrowed above than in *R. candicans* and the st. more deeply furrowed and rarely rooting. But the species is an exceedingly aggregate one with us, as on the Continent.

SECT. II. St. arcuate-prostrate or climbing, often rooting,
hairy or pubescent.

a. St. more or less pruinose.

31. *R. argentatus* P. J. Muell. in *Pollich.* xvi.-xvii. 93 (1859). *R. Winteri* Focke, *Syn. R. G.* St. high-arching at first, then climbing or bending low and rooting, hardly furrowed, *pruinose below*, somewhat thinly or more densely pubescent, and *hairy*. Prk. long, stout-based, patent or declining, rarely falcate. Ls. *subcoriaceous*, with wavy edge, irregularly serrate, thinly strigose and *shining above*, *greenish-white-felted with shining hairs beneath*; term. oval or roundish-ovate with rounded or *subcordate base* and acuminate or cuspidate point. Pan. *lax, pyramidal*, with 1-flowered or cymose few-flowered branches above and 3-fid and simple floral l.; rach. and ped. *felted, with thick villous hair* and many long slender declining and slightly falcate prk. Fl. *showy, cuplike, with long ped.* Sep. with *yellowish-grey felt and hair, loosely reflexed*. Pet. roundish, short-clawed, bright pink or white. Stam. pink, *far exceeding green sty.* Carp. hairy.

Set. No. 30. Bushy places, wood borders and hedges. Apparently fairly frequent in most parts of England and Wales.

V.C. in G. Britain 26. Irish Co. 1. Guernsey! Jersey!

N.-W. Germany! France!

A very handsome bramble, with striking contrasts of colour in l. and pan.; coming late into flower with us, as on the Continent. The bracts are usually gland-ciliate (with sessile glands), and occasionally a few sunken glands occur on rach. and ped. The common Herefordshire form, represented by No. 30 in the Set, with its roundish and rather shortly pointed term. lt., seems hardly different from Dr. Focke's *R. amiantinus*, which he would now put as a var. under *R. argentatus*. More frequently the term. lt. is oval and long-pointed. Late in the season, or in shade, the l. often lose their felt.

Var. *robustus* (P. J. Muell.) in *Pollich.* xvi.-xvii. 87 (1859). *R. macroacanthus* Blox. (in part). Perhaps a very strong form, rather than a distinctly marked var., of *R. argentatus*, from which it chiefly differs (beyond being stouter and more prickly) by its *thicker and often more deeply incised lts.*, with more acuminate point and *cordate or subcordate base*; together with a more elongate pan. nearly *cylindrical* above. The large prk. are usually crowded, unequal, much compressed and more frequently falcate than in the type; and some of the leaf-tothing is patent, as well as otherwise very irregular.

Set. No. 113. Thickets and rough bushy ground. From Dorset and Hants to Derby and Carnarvon, fairly frequent.

V.C. in England and Wales 11 [2]. Guernsey!

Germany. Normandy!

Large stout bushes going off from typical *R. argentatus* towards *R. leucostachys*.

Var. *clivicola* A. Ley in *Journ. Bot.* 1896, 158. *Prk. shorter. Its. with very wavy edge, more thickly strigose above, usually smaller; term. short, roundish-ovate, with long cuspidate or cuspidate-acuminate point and long stalk. Pan. with long corymbose-cylindrical ultra-axillary top; rach. with some sunken glands and crowded rather weak falcate and declining prk. Pet. and stam. pinkish.*

Set, No. 114. In bushy places, woods and hedges, especially in hilly districts. From W. Cornwall to Montgomery, Oxfordshire, Bucks, and Kent. Remarkably common in the valley of the Upper Wye.

V.C. in England and Wales 11. Endemic?

A constant and strongly marked var., with peculiar term. lt. and broad ultra-axillary pan.

32. *R. rusticana* Merc. *Reut. Cat. Pl. Vasc. Genev.* ed. ii. 279 (1861). *R. discolor* of many authors. *R. ulmifolius* Schott (in part). St. arcuate-prostrate or climbing, rooting, furrowed, pruinose, stellately downy. Prk. long, with very large base, declining or nearly patent. L. 3-5-nate, often pedate, small. Its. coriaceous, convex, finely, but towards the point doubly, serrate, dark green glabrous or nearly so and somewhat wrinkled above, with close whitish felt beneath; term. normally obovate-cuspidate, with narrow entire base and stalk about $\frac{1}{3}$ its length. Pan. long, narrow, cylindrical, in great part ultra-axillary; middle branches short, cymose; rach. furrowed, felted, with very strong stout-based hooked and falcate prk.; ped. and sep. whitish-felted. Fl. showy. Sep. reflexed. Pet. roundish, usually bright red, as are the styles. Stam. ('with completely equal well-formed small pollen grains'—Focke) barely equalling the sty., or shorter. Frt. small, dry and usually of indifferent flavour with us, 'very sweet' in S. Germany. Carp. hairy.

Set, No. 32. Hedges and thickets in open ground and at rather low altitude, especially in clayey and calcareous soils and by the sea-coast; much less common in sandy ground. Generally distributed in the lowlands of England, Wales and Ireland. Rare in Scotland, where it seems to have been recorded from only 5 of the 41 vice-counties.

V.C. in G. Britain 70. Generally distributed in Ireland. Guernsey! Jersey! Sark! Brittany! Normandy! W. and S. Europe generally and the whole of the Mediterranean region. Azores. Madeira. Canary Islands. New Zealand (locally abundant as a naturalised plant)!

Later in coming into fl. (by two or three weeks) than the vast majority of species, and usually among the last to abstain from flowering in the late autumn, or even up to midwinter. Generally recognisable at a glance by the very pruinose st., large-based hooked pan.-prk. and small white-felted obovate-cuspidate Its.; but (without taking into account the white-flowered and amber-fruited forms) there are numerous variations in form of lt., pan.-armature, etc., which, though mostly inconsiderable, may occasionally cause difficulty in identification. *R. rusticana* hybridises freely, especially with *R. leucostachys* in calcareous soils and with *R. caesius* in clayey ones. In *Journ. Bot.* 1890, 129, Dr. Focke retains the name *rusticanus* (previously suggested for our plant by Prof. Babington) in preference to the much earlier *ulmifolius*, on the ground that the latter 'may perhaps be used in a more aggregate sense.' Here, as in the case of *R. suberectus*, I follow in their steps.

b. St. epruinose.

33. *R. pubescens* Weihe in *Boenn. Prodr. Fl. Monast.* 152 (1824); not of Vest. *R. thyrsoideus* of British authors (in part). St. somewhat less high-arching at first than in *R. thyrsoideus*, then low and rooting, epruinose, somewhat furrowed, normally with a rather thick coat of

short stellate pubescence. Prk. strong, broad-based, nearly straight or falcate, exceptionally hairy. L. 5-nate-digitate. Lts. with irregular shallow teeth, thinly strigose above, grey or greenish-white-felted beneath, rarely losing felt in old age; term. oval or slightly obovate with long gradually acuminate point, emarginate or entire base, and stalk about $\frac{1}{2}$ its length. Pan. rather lax, with moderately long ultra-axillary top slightly narrowed above, nearly patent few-flowered branches, and strong hooked or falcate prk. on rach. Fl. handsome. Sep. reflexed with upturned tip. Pet. white, rarely pink. Stam. variable in length, in type exceeding sty. Carp. somewhat hairy.

Set, No. 115 (not the typical plant, nor very near it). Distribution uncertain owing to the great variableness of our *pubescens*-like forms; but plants which seem to belong to the species in an aggregate sense occur in several counties from Cornwall to Norfolk and Anglesey.

V.C. in England and Wales (the aggregate, exclusive of var. *subinermis*) 11 [9]. Irish Co. 1.

Germany! France.

R. pubescens is one of our most difficult species. The typical plant seems absent, all our forms differing from it in their less gradually acuminate term. lt. or their weaker and less curved pan.-prk. Usually also the st. is more thinly hairy with us than in the typical German plant. As an aggregate the species seems to occupy intermediate ground between *R. thyrsoideus* and *R. rusticus*.

Var. *subinermis* Rogers in *Journ. Bot.* 1894, 45; not of Mueller and Lefvre nor of Ruprecht. *R. macrophyllus* E. B. *Supp.* t. 2625. Prk. shorter. L. 3-5-nate-pedate, rarely digitate, often very large. Term. lt. normally obovate-acuminate, less gradually tapering to a point than in the type, and often more narrowed towards the base. Pan. rather dense in the upper part of the ultra-axillary top; rach. quite unarmed, or with a few weak declining prk. only. Pet. white or pinkish, narrowing gradually into the claw. Stam. upright. Carp. conspicuously hairy.

Set, No. 81. Moors, hedges and thickets. From Dorset and Sussex to Staffordshire, a fairly frequent and locally abundant bramble.

V.C. in England 12. Endemic?

When I showed Dorset living bushes of this var. to Dr. Focke in 1889, he said of it, 'Very near *R. pubescens* except for the weak prk.' It seems to be far our most constant form of the aggregate species, and to have been formerly confused (perhaps generally) with *R. macrophyllus*, as I have Surrey specimens so named by the late Mr. H. C. Watson and have seen others from the Sowerby hb. in the British Museum.

GROUP VI. SILVATICI. See pp. 4, 10.

SECT. I. Pan.-prk. normally acicular, declining; in some forms of *R. lentiginosus* stronger, falcate.

a. Frt.-sep. reflexed. Stam. considerably exceeding sty.

34. *R. silvaticus* Wh. & N. Rub. *Germ.* 41, t. 15 (1825); not of Wirtgen. St. arcuate-prostrate, rarely climbing, angular above, roundish below, unequally clothed with rather long white hair. Prk. short, stout-based, declining; near base of st. crowded, subulate. L. 5-nate-digitate. Lts. hairy on both sides, often soft beneath, rather yellowish-green, usually narrow and long pointed, with coarse irregular toothing; term. slightly obovate or oval, acuminate, with entire or emarginate base, 3 to 4 times the length of its stalk. Pan. long, eglandular, with small acicular prk. and villous hairs on rach. and ped., cylindrical-corymbose

with crowded short patent or patent-erect branches and narrow simple 3-fid floral l. above, and rather long ascending racemose-corymbose branches below. Frt.-sep. rather *loosely reflexed*. Pet. fairly large, obovate with short claw, white, rarely pinkish. Stam. exceeding sty. Carp. with long hairs at their tip.

Set. No. 82. Woods, thickets and bushy riversides. Uncommon, but occurring in several counties from Cornwall to Carnarvonshire and Herts.

V.C. in England and Wales 18 [2]. Irish Co. 2 [1].

N.-W. Germany!

Though from the smallness of its prk. and its general hairiness nearest on the whole to *R. macrophyllus* and its allies in this group, *R. silvaticus* also recalls *R. villicaulis* and *R. Lindleianus* from the two last groups, in many respects even seeming somewhat intermediate between those two species. It is however far less prickly than either of them, and much more softly hairy than *R. Lindleianus*. Its most marked characters are the small acicular prk. and crowded narrow floral l. of pan. and the narrow (usually slightly obovate-acuminate) lts. of all the leaves.

b. Frt.-sep. patent or erect. Stam. and sty. subequal.

(i.) Pan. almost unarmed; its prk., when present, very few, subulate.

35. [*R. myricæ* Focke in *Alpers. Verz. Gefpfl. Stad.* p. 27 (1875). St. blunt-angled, with convex faces, rather thinly hairy. Prk. few, short, subulate, stout-based, declining. L. 3-5-nate, mostly 3-nate. Lts. almost simply and rather bluntly dentate, green and hairy on both sides, soft beneath when young; term. oval, acuminate, cordate. Pan. narrow, racemose or subracemose above, with axillary racemose branches; rach. felted, with villous hairs, unarmed or very slightly armed with short subulate prk., normally eglandular. Sep. embracing frt., externally greyish-olive with villous hair. Pet. oblong, white. Stam. nearly equalling sty. Carp. hairy.

Not known as British, the Monmouthshire plant formerly thus named by Dr. Focke being now pronounced by him distinct. See below, p. 47 (*R. orthoclados* A. Ley.).]

(ii.) Pan.-prk. many, mostly acicular, declining (in *R. lentiginosus* sometimes stronger, falcate); with some stalked and subsessile glands.

Var. *hesperius* Rogers in *Journ. Bot.* 1896, 504, 505. Differs from Dr. Focke's description of *R. myricæ* by st. with flat striate or subsulcate faces (sometimes slightly aciculate and glandular) and more numerous prk.; l. normally 5-nate-pedate; lts. with very compound finely pointed serrations, very thinly hairy beneath; term. roundish-ovate with long acuminate point; pan. elongate, more compound, more prickly, with many sunken subsessile glands on rach.; sep. patent in frt., usually aciculate and glandular; stam. slightly exceeding sty.; carp. apparently glabrous.

Not in Set. As yet found only in Ireland: to the N. and N.-E. of L. Corrib, in Co. Mayo and Galway. In that neighbourhood one of the most frequent and most constant brambles. Endemic?

R. hesperius looks just intermediate between *R. silvaticus* and *R. hirtifolius*. Dr. Focke was at first disposed to place it under *R. Salteri*. On seeing further specimens he associated it with his *R. myricæ*; but he is not responsible for its position here as a var. of that species.

36. *R. lentiginosus* Lees in *Steele*, 60 (1847). *R. affinis*, var. *lentiginosus* Bab. *Rub.* 72. *R. cambricus* Focke (incl. var. *devoniensis* Focke ms.). *Journ. Bot.* 1896, 286, 291. St. arcuate-prostrate, with striate or slightly furrowed faces, thinly hairy. Prk. many; the larger conical, declining or hooked, from large compressed base, the smaller nearly

patent; often with red sessile glands and a few small acic. L. 5-natedigitate or pedate; rarely 6-7-nate, with exceptionally long petiole. *Lts.* thin, very rarely imbricate, subglabrous or thinly strigose above, hairy only on the nerves beneath, with teeth nearly always finely pointed, usually incised and very compound though sometimes nearly simple; term. oblong or obovate, acuminate, with rather narrow emarginate base, and stalk about $\frac{1}{3}$ its length; petiole, petiolules and midribs usually very prickly. *Pan.* very lax below with long ascending subracemose branches; rather rigid above, with long-peduncled 1-2-flowered patent branches and subsessile term. fl.; rach. and ped. with villous hair, a few sunken stkd. gl. and crowded prk. which are normally acicular and declining or shortly hooked, but occasionally much stronger and falcate. *Sep.* usually erect in frt., often aciculate and glandular. Pet. narrow, pinkish, usually not extending beyond the cal. *Stam. and sty. subequal.* *Frt. oblong.* *Carp.* well developed, glabrous or hairy.

Not in Set. Rough, rocky and bushy ground. As an aggregate species widely though perhaps thinly spread from Devon and Kent to Norfolk and Carnarvonshire.

V.C. in England and Wales 8 [3]. Endemic?

A rather variable species; on the one hand recalling *R. nitidus*, though somewhat different in habit and too glandular in pan. and hairy in st. for the *subrhamnifolii*; on the other hand approaching *R. Questierii* and (in its more prickly state) *R. Colemanni*. Its subracemose truncate pan. is a very marked feature, with rigid branches, highly aciculate rach. and ped., and oblong frt. usually embraced by the erect sep. The prk., though varying considerably, and sometimes nearly wholly straight, show a great tendency to become hooked or falcate, even when keeping acicular. The form with strong very crowded falcate prk. seems to be local and abnormal.

SECT. II. Pan.-prk. at most only moderately strong, chiefly declining.

a. Pan. normally eglandular. Frt.-sep. reflexed.

37. *R. macrophyllus* Wh. & N. *Rub. Germ.* 35, t. 12 (excl. var. β) (1825). St. stout, arcuate-prostrate or climbing, rather blunt-angled with flat faces, softly hairy (clustered and long single hairs mixed), subgla-brescent. Prk. moderately strong, falcate and declining. L. 5-natedigitate, often very large. *Lts.* not imbricate, coarsely and irregularly serrate, glabrescent above, softly hairy beneath, and when young sometimes slightly felted; term. oval-cordate with long acuminate point and stalk $\frac{1}{3}$ to nearly $\frac{1}{2}$ its length, or broader with shorter point; rarely somewhat obovate. *Pan.* normally weak, with fairly long ultra-axillary part, the topmost branches rather lax, erect-patent or nearly patent, 1-3-flowered with shortly pedicelled term. fl.; rach. and ped. villous-felted, with weak declining or subfalcate prk.; simple floral l. rare; lower branches very distant, 3-7-flowered. Fl. medium-sized. *Sep.* unarmed, with shaggy grey felt, strongly reflexed in the typical plant. Pet. obovate, pink or white. *Stam.* exceeding *sty.* *Frt.* large, sweet. *Carp.* glabrous, rarely with few hairs at tip.

Set. No. 83 (not typical). Woods and thickets; thriving in shade. As an aggregate species widely distributed in Great Britain and Ireland, but very variable and apparently seldom quite typical.

V.C. in G. Britain 42 [16]. Irish Co. 8 [3]. Jersey!

Brittany! Normandy! W. Europe. Austria.

Naturalised in New Zealand! 'local' (T. Kirk in litt. 1895).

Usually a much-branched bramble, with very conspicuous l. green on both sides (in outline like those of *R. pallidus* Wh. & N.) and a rather poorly developed eglandular pan. with narrow ultra-axillary part. 'A true forest plant,' Dr. Focke says, 'loving fresh somewhat moist soil and

moderate shade.' *R. piletostachys* Gren. & Godr. is a form with more coarsely toothed l., and more nearly roundish term. lt. and a few stkd. gl. on the pan., which occasionally occurs with us, as on the Continent. Other forms somewhat intermediate between the type and *R. Schlechtendalii* seem more frequent. My *R. pubescens*, var. *subinermis* is rather near *R. macrophyllus*, but may be distinguished from it by the shorter closer stellate hairs, *without intermixture of long single ones*, on st., the *more pedate 3-5-nate l.*, the *obovate lts. more hairy above and grey-felted beneath*, the narrower *entire or emarginate base of term. lt.*, the better developed and more compact pan. with remarkably patent upper branches and rather shorter hair on rach. ped. and sep., and the conspicuously *hairy carp.*

Subsp. *Schlechtendalii* (Weihe) in *Boenn. Prodr. Fl. Monast.* 152 (1824). Differs from *R. macrophyllus* by *lts. strigose above and more sharply toothed; term. obovate-oblong with greatest breadth near the more cuspidate point*, a somewhat *cuneate* entire or slightly *emarginate base*, and stalk often barely $\frac{1}{3}$ its length; *pan. broader* usually shorter, *with larger fl. and larger upper l.*; pet. white with pink claw or wholly pink, and stam. usually pink.

Set. No. 84. In open thickets and hedges rather than in woods. At least as widely distributed as *R. macrophyllus*, and usually more abundant.

V.C. in G. Britain 38 [1]. Irish Co. 8.

Germany! France.

Naturalised in New Zealand (South Island)!

Though connected with typical *R. macrophyllus* by intermediate forms, this is commonly a well-marked bramble. Its prk. are mostly stronger and straighter than in the type and its leaf-toothing more compound as well as much more finely pointed. In well-developed plants the fl. are almost as large as in *R. gratus*, but on dry ground usually much smaller.

b. Pan. somewhat glandular. Frt.-sep. loosely reflexed or subpatent (in *R. Questierii* usually strongly reflexed).

Var. *macrophyloides* (Genev.) in *Mém. Soc. Acad. M. & L.* xxiv. 127 (1868). A handsome form or var. of *R. Schlechtendalii* with still *more compound and deeply incised leaf-toothing, numerous unequal stkd. gl.* (usually sunken) *on pan.* and an occasional acic. or stkd. gl. on st. The floral organs are usually all pink, the pan. laxer and the frt.-sep. less reflexed than in *R. macrophyllus* and *R. Schlechtendalii* and the *whole plant more softly hairy.*

Not in Set. So far known only from a few W. England counties and one locality in Perthshire.

V.C. in G. Britain 6. Guernsey! Sark (very abundant)!

France.

Var. *amplificatus* (Lees) in *Steele*, 58 (1847). *R. macrophyllus* γ . *amplificatus* Bab. Near *R. Schlechtendalii* and differing from it chiefly by prk. usually very long-based (especially on pan.); *lts. with much longer and more gradually acuminate point and more deeply incised compound teeth; pan. long, more pyramidal*, with long lower branches and somewhat fasciculate upper ones, numerous narrow floral l., a very *prickly more or less glandular rach. and smaller fl.* The st. is often as hairy as in *R. Schlechtendalii*, but sometimes subglabrescent, with an occasional stkd. gl. or acic. between the rather crowded prk. Rarely the term. lt. has a fairly broad and subcordate base, though it is usually quite cuneate below and entire based.

Set. No. 33. Apparently absent from the extreme south of England, and not very generally distributed through the rest of Great Britain.

V.C. in G. Britain 20. Irish Co. 1 [2]. Endemic?

Prof. Babington has suggested the name *R. amphichloros* P. J. Muell. for several plants from the North of England, and Dr. Focke for one from Wexford; and the latter botanist thinks that Mueller's plant may be distinguished from Lees' *amplificatus* by the rounder outline and finer serration of the lts. But the British specimens thus named in the Cambridge herb. seem different from the Wexford plant and look as if they might well be referred to well-known British species. For the present therefore it seems best not to admit the new name into our list.

38. *R. Questierii* Lefv. & Muell. in *Pollich.* xvi.-xvii. 120 (1859). *R. calvatus* Bor. (not of Bloxam). *R. fallax* Chab. *R. acuminatus* Genev. St. subsulcate, considerably or thinly hairy, often glabrescent. Prk. very strong, with long, much compressed base, declining. L. 5-nate-digitate or pedate. Lts. green and thinly hairy on both sides, rarely paler and very softly hairy beneath, with irregular compound teeth, usually long and narrow; term. oval or obovate, with long cuspidate-acuminate point, entire or emarginate base, and stalk less than $\frac{1}{3}$ its length. Pan. long, lax, narrow, usually leafy to the top and often over-topped by the very narrow simple floral leaves; rach. grey-felted and hairy, usually flexuose, with declining prk. and some stkd. gl.; the lower branches nearly erect, the topmost often patent short 1-3-flowered; ped. and strongly reflexed sep. remarkably whitish-felted. Floral organs usually pink or pinkish. Stam. exceeding sty. Carp. glabrous or glabrescent.

Set, No. 117 and such sheets of No. 6 as contain specimens (labelled *R. erythrinus*) collected at Baillie Gate. Woods and thickets in rough rocky ground. Locally abundant in Dorset. Occurring also in Berks and in several W. England and Welsh counties, but not always typical.

V.C. in England and Wales 7 [3]. Irish Co. [1]. Jersey!

Brittany! Normandy! Central France.

The typical plant, as described above, can scarcely be confused with any other bramble, the long narrow pan. and the association of whitish-felted rach. ped. and sep. with green leaves being so remarkable. Our Dorset plant, as represented in the Set, is identical with that found in Jersey and (abundantly) in Brittany and Normandy; but in Devon Herefordshire and some Welsh counties occur forms which can hardly be specifically separated from *R. Questierii*, though they have st. with smaller and more crowded prk., lts. broader and often more finely toothed and pan. less contracted and with more numerous stkd. gl. These forms are not all identical, but they all diverge from typical *R. Questierii*, in some cases towards *R. amplificatus*, in others towards *R. Colemanni*. A luxuriant Co. Down form, in most respects more typical than these, is conspicuously different in its broad cylindrical-corymbose ultra-axillary pan. top, with many-flowered long-peduncled branches and loosely reflexed sep.

c. Pan. usually having few sunken gl. Frt.-sep. clasping.

39. *R. Salteri* Bab. in *Ann. Nat. Hist. Ser. I.* xvii. 172 (1846). St. arcuate-prostrate, deeply striate or furrowed, fairly hairy at first, sub-glabrescent, with an occasional stkd. gl. or acic., fuscous. Prk. somewhat declining, mostly rather weak. L. chiefly 5-nate-pedate. Lts. rarely imbricate, often all broad, very thinly strigose or subglabrous above, paler and hairy or often ashy-felted beneath, with compound teeth either loose and incise-lobate, or closer comparatively shallow and finely pointed; term. long-stalked, roundish-acuminate or narrower, with rather long point and entire or somewhat cordate base. Pan. long, cylindrical above, with 1-3-flowered long-peduncled patent and (more rarely) patent-erect branches and usually a good many simple floral l.

shorter than the branches, *the top blunt*, and the term. fl. sub sessile; rach. and ped. nearly straight, felted and villous, with many acicular declining prk. and usually a few inconspicuous sunken gl. *Sep. with long point embracing frt.* Pet. narrow, white or pinkish. Stam. of unequal length usually exceeding sty. *Frt. ovate, elongate.* Young carp. thinly or considerably hairy.

Set. No. 35. Woods, thickets and open rough ground. Very local.

V.C. in G. Britain 4 [4]. Irish Co. [3]. France.

Near *R. hirtifolius* Muell. and Wirtg. (see below, p. 48), and possibly only one of its local forms. It has however a less hairy st., much more deeply incised lts. subglabrous above and often ashy-felted beneath, and a more closely felted and far less glandular pan.-rach. than we find in *R. hirtifolius*, while its frt.-sep. apparently are also more permanently erect. So for the present, at all events, it seems best to regard it as distinct. Prof. Babington considered the Isle of Wight plant his type, and that seems to go further from *R. hirtifolius* towards *R. Questierii* than do the stronger Herefordshire and Leicestershire forms.

SECT. III. Pan.-prk. very strong, long-based, often hooked.

40. *R. Colemanni* Blox. in Kirby, 38 (1850). *R. fusco-ater*, b. *Colemanni* Bab. *Man.* ed. 3, 101. *R. infestus* Blox. ms. St. strong, rather high-arching, somewhat furrowed, at first with a good many clustered and single hairs and often a few stkd. gl. and acic., subglabrescent. *Prk. many, much compressed*, varying from patent to hooked, *with very long broad base*. L. chiefly 5-nate, *remarkably convex*. Lts. often plicate, occasionally imbricate, opaque and strigose above, paler and softly hairy beneath, with rather coarse irregular toothing and *very prickly petioles and petiolules*; term. *broadly obovate-acuminate cordate*, with stalk about $\frac{2}{3}$ its length. Pan. long, pyramidal, the cylindrical ultra-axillary top with many-flowered erect-patent cymose branches and a few simple or 3-fid floral l.; rach. and ped. hairy and *very strongly armed like st.*, often with a good many acic. and stkd. gl. Sep. usually aciculate and glandular, loosely reflexed in frt. Pet. large, oval, pink or white. Stam. often pink, exceeding reddish sty. Carp. nearly or quite glabrous.

Set. No. 12. Heaths, hedges and thickets. Locally abundant in at least two or three English counties, and perhaps occurring in three or four more. Extinct near Coventry (one of Mr. Bloxam's original localities).

V.C. in England 3 [3]. Scotland [1]. Irish Co. [1]. Endemic?

A showy very prickly plant, looking curiously intermediate between *R. affinis* Wh. & N. and *R. infestus* Weihe, but in most respects nearer to the latter. Perhaps it may be said that *R. Colemanni* occupies a position among the *Silvatici* analogous to that held by *R. infestus* among the *Egregii*. The Surrey and Berks plant has less roundish lts. and more hooked prk. than Mr. Bloxam's Leicestershire type; but the resemblance in other respects is too close to admit of their being separated from each other.

In 1896 Major Wolley-Dod collected a bramble at Constantia Nek near Capetown which strongly recalls *R. Colemanni*, though (remarkably enough) going off from it towards *R. affinis*; but he describes his plant as 'prostrate,' and it is no doubt distinct from both our British species.

GROUP VII. VESTITI. See pp. 4, 11.

SECT. I. Stam. not connivent. Carp. hairy.

41. *R. Sprengelii* Weihe in *Flora* ii. 18 (1819). Incl. *R. Borreri* of Babington and many British authors, but not of Bell Salter. St. arcuate, soon nearly prostrate, much branched, bluntly angled or roundish, with many lax chiefly single hairs, a few scattered prklets and usually still fewer

stkd. gl. Prk. many, rather short, falcate or declining. Ls. thin, with scattered hairs on both sides, concolorous, *coarsely and irregularly dentate*; term. usually oval, with long gradually acuminate point, entire or slightly emarginate base and stalk scarcely more than $\frac{1}{4}$ its length. Pan. short, lax, diffuse, with long patent few-flowered branches (the fl. with exceptionally long slender ped.) and subsessile term. fl., often with one or two simple floral l.; rach. and ped. villous-felted, with few or many sunken gl. and some inconspicuous declining acic. or falcate acicular prk. Fl. rather small. Frt.-sep. erect or patent. Pet. obovate, crumpled hairy, normally bright pink. Stam. pinkish, barely equalling the sty., not connivent. Carp. hairy.

Set. No. 36. Woods, thickets and heaths; especially on light sandy soil. Distributed through the greater part of Britain, from Cornwall and Kent to Wigton and Kirkcudbright, but not yet recorded from the rest of Scotland, and only somewhat sparingly from Wales and Ireland.

V.C. in G. Britain 45 [1]. Irish Co. 3.

Guernsey! Jersey!

Denmark. N.-W. and Central Germany! Holland. Belgium. N. France.

A very distinct and beautiful species, rarely becoming stout or very strong, but varying, according to habitat, with larger l. and fl., few or many 5-nate l., thinner or denser hair, and more or less numerous glands. Sometimes the outer row of stam. are exceptionally long; occasionally the lts. are rather deeply incised; and there is a very rare white-flowered form. But through all these variations the species can usually be recognised without difficulty; the loose diffuse pan., long ped., short stam. and erect frt.-sep. being especially characteristic features.

SECT. II. Stam. connivent. Carp. glabrous or hairy.

a. St. very high-arching or suberect. Sep. externally olive, with narrow white margin, embracing frt. Carp. hairy.

42. *R. orthoclados* A. Ley in *Journ. Bot.* 1896, 159; not of Boulay. St. bluntly angled, *very high-arching or suberect*, hairy, with scattered prklets and few or many unequal stkd. gl. Prk. slender, almost subulate, straight or slightly curved. L. 3-5-nate-pedate, concolorous. Lts. thinly hairy on both sides, with very irregular teeth, shallow or incised, even or partly recurved, rarely rather compound; term. with long gradually acuminate point, oval or ovate, with entire or emarginate base. Pan. slender, lax, *subracemose-corymbose above*, with blunt top and wavy rach.; rach. ped. and cal. felted, hairy, with numerous unequal stkd. gl. often far exceeding the hair. Sep. externally olive with narrow white margin and long points embracing the round acid frt. Pet. obovate white. Stam. exceeding sty. Carp. hairy at tip.

Set. No. 60 (as '*R. myricæ* Focke, var. *virescens* G. Braun, forma *glanduligera*' teste Focke). As yet observed nowhere in the British Isles except on Beacon Hill, Monmouthshire, though there 'occupying a large area of woodland (some three square miles).' Consequently a briefer account of it might have been sufficient here but for the interesting fact (communicated to me with spns. by Dr. Focke) of its discovery in 1898 in Belgium by M. Gravet at Louette St. Pierre ('alt. 385 m.').

The combination of hairy st. and conspicuously glandular pan. with habit pan. and sep. so like those of the *Suberecti* is very remarkable. Though Dr. Focke, on seeing the plant growing on Beacon Hill in 1894, withdrew the name he had before suggested, the resemblance to his *R. myricæ* and to the plant which I have ventured to place under it as var. *hesperius* is evidently fairly close. On the whole however its nearest ally seems to be *R. Sprengelii*, with which Mr. Ley thinks it hybridises on Beacon Hill.

b. St. arcuate-prostrate, rather densely hairy. Pan. elongate. Sep. ashy-felted.

(i.) Term. lt. usually quite 3 times longer than its stalk.

43. *R. micans* Gren. & Godr. *Fl. Fr.* i. 546 (1848); not of Weihe. *R. hypoleucus* Lefv. & Muell. (1859). *R. adscitus* Genev. (1860). St. low-arching, angular, clothed with dense felt or close short hair, numerous longer hairs, and usually some scattered prklets, acic., or stkd. gl. Prk. rather unequal, mostly declining from long broad base. *L.* 3-5-nate-pedate, rarely digitate. *Lts.* greyish-green opaque and thinly strigose above, ashy-felted and softly hairy beneath, with compound strongly incised serrations; term. obovate, rarely oval, with long cuspidate-acuminate or nearly acuminate point and entire or emarginate base. *Pan.* lax, with fairly long subpyramidal-corymbose top, subsessile term. fl., and often several simple floral l.; the branches long, nearly or quite patent, corymbose; flexuose rach., ped. and sep. ashy-felted and hairy, with declining prk. (usually acicular) and some unequal stkd. gl. and acic., —the stkd. gl. being usually few and sunken on rach., but often numerous and more conspicuous on ped. and on the very narrow bracts. *Sep.* strongly reflexed, often glandular. Pet. large, pinkish or white. Stam. exceeding sty. Frt. round. Carp. glabrous or glabrescent. Whole plant remarkably greyish.

Set. No. 13. Bushy places and open stony ground. Locally abundant from Cornwall and Sussex to Berks and Carnarvonshire.

V.C. in Great Britain 20 [5]. Irish Co. 1 [1]. Jersey!

Brittany! Normandy! W. France, abundant.

Usually one of our most easily recognised brambles; its greyish tint, close-haired or felted st., deeply incised lts. and wavy pan.-rach. being in most cases strongly marked features. Sometimes however the st., though very hairy, is destitute of all acicular and glandular development, while the pan. is nearly or quite eglandular, narrower, more cylindrical and with nearly straight rach. There is also a Carnarvonshire form, especially abundant about Bethesda, with rather thinly hairy st., and narrow pan., which diverges from type towards *R. Schlechtendalii*. Our common plant is identical with Genevier's *R. adscitus*, and Dr. Focke believes that it cannot be separated from the earlier *R. micans* and *R. hypoleucus*, which I have not seen. Cf. *Genev. Ess. Mon.* pp. 116-118.

(ii.) Term. lt. from 2 to $2\frac{1}{2}$, or rarely 3 times the length of its stalk.

44. *R. hirtifolius* Muell. & Wirtg. *Hb. Rub. Rhen.* ed. i. n. 173; not of Briggs (*Fl. Plym.* 116), nor of many other British authors. St. deeply striate or subsulcate, considerably hairy, normally eglandular, occasionally with a few acic. or stkd. gl. Pan.-prk. long-based, declining or slightly falcate. L. mostly 5-nate-pedate. Lts. rarely imbricate, usually sharply biserrate, closely strigose and often much wrinkled above, paler and somewhat softly hairy (rarely greenish-felted) with prominent ribs beneath; term. nearly thrice as long as its stalk, ovate with long gradually acuminate point, or more roundish with rather shorter point, with emarginate or subcordate base. Pan. with long lax ultra-axillary top (slightly narrowed upwards) and nearly patent many-flowered branches; rach. and ped. villous, with many unequal declining and falcate prk. and usually some unequal acic. and stkd. gl.; floral l. various, often several. Fl. medium-sized. Cal. less deeply divided than usual; sep. shaggy, aciculate and somewhat glandular, soon erect, ultimately patent or loosely reflexed. Pet. narrow, pinkish. Stam. exceeding sty. Frt. oblong. Young carp. glabrous or slightly hairy.

Set. No. 118. Chiefly in bushy places. Locally abundant in the hilly districts of W. England and Wales.

V.C. in G. Britain 13 [2]. Irish Co. 3 [3].
Germany.

A variable species, apparently including a series of closely allied forms intermediate between *R. macrophyllus* and *R. pyramidalis*, but usually considerably nearer to the latter. From that it may be distinguished by l. much less velvety to the touch beneath (and not unfrequently only thinly hairy) and pan. laxer broader and less leafy, with ascending frt.-sep. and conspicuously oblong frt.

Var. *danicus* Focke in *Poton. Flora*, 1885. ? *R. leptothrysos* G. Braun. Prk. usually longer. Lts. thinner, with shallow nearly even teeth, *plane* or *slightly plicate* above, with shining close hair (but no felt) beneath; term. about $2\frac{1}{2}$ times as long as its stalk, obovate-roundish with long acuminate point and entire or slightly emarginate base. Pan. with broader and more compact ultra-axillary top, numerous *patent* 1-3-flowered branches, stronger fewer rach.-prk. and *more showy* fl. with very conspicuous white stam., white oval or slightly obovate pet. and *subpatent* or *loosely reflexed* frt.-sep.

Not in the Set. Wood borders and open bushy places. Common in Scotland, and apparently not rare in W. England and Wales.

V.C. in G. Britain 17. Irish Co. 3.
Germany!

Though the ultra-axillary part of the pan. is nearly cylindrical in this var., it is usually narrowed at the top; while in var. *mollissimus* it mostly keeps quite cylindrical to the broad corymbose top. In the hb. the two forms are sometimes distinguished with difficulty, though not when the specimens are sufficiently full and characteristic.

Var. *mollissimus* (Rogers) in *Journ. Bot.* 1894, 45. Very like var. *danicus*, but with lts. *flaccid*, more deeply and irregularly toothed, *very wrinkled* above and *greyish-felted* or *very softly hairy* beneath; term. lt. roundish-oval, with rather shorter point; pan. still broader and more strictly *cylindrical-corymbose*, wholly or very nearly eglandular and usually armed only with *weak acicular* prk. (as in *R. sylvaticus*); fl. handsome, cup-shaped; pet. roundish, pale lilac; stam. and sty. pinkish. Whole plant more softly hairy.

Set. No. 85. Heaths, bushy places, woods. Apparently rather thinly distributed (though locally in good quantity), and chiefly in the West.

V.C. in England and Wales 8 [1]. Irish Co. 4. Endemic?

(iii.) Term. lt. often four times the length of its stalk. Prk. long-pointed.

45. *R. iricus* Rogers in *Journ. Bot.*, 1896, 506. St. stout, somewhat furrowed, fuscous or purplish, with many *patent* white hairs. Prk. many, *patent* or declining. L. large 5-nate, with very long narrow ciliate stip. Lts. *coriaceous*, hardly imbricate, opaque subrugose and thinly strigose above, with crowded shining white hairs beneath and ashy felt when young, coarsely and irregularly toothed, sometimes rather deeply incised; term. oval or ovate, with gradually acuminate point, emarginate base, and stalk about $\frac{1}{2}$ its length. Pan. *remarkably stout and broad*, with very large greenish and ashy-felted l. (3-5-nate below passing into 3-fid or simple ones above), broadly *cylindrical-corymbose* ultra-axillary top with stout *nearly patent* cymose branches, rach. ped. and base of sep. clothed with dense yellowish-grey villous hairs and felt; prk. slender and almost acicular above, strong and unequal below; bracts many, conspicuous, sometimes gland-ciliate. Sep. ashy-felted inside and out, reddening at base within, with long acuminate point strongly reflexed on fall of pet. Pet. large, broadly obovate, bright pink. Stam. bright pink, exceeding sty. No fruit seen.

Not in Set. Locally abundant in Co. Mayo and Galway ('both on Upper Silurian and limestone' Rev. E. S. Marshall), and as yet known only there and in the neighbourhood of Cork. Endemic?

Of this very handsome bramble Dr. Focke writes (in litt. to its discoverer, Rev. E. S. Marshall, January 1897), 'It seems to approach in several respects the *R. Hochstetterorum* of the Azores.' It also recalls the stouter forms of my *R. mollissimus*, though apparently keeping distinct from it.

46. *R. pyramidalis* Kalt. *Fl. Aach. Beck.* p. 275 (1845); not of Babington. *R. villicaulis* Blox. and of many British authors. St. arcuate-prostrate or climbing, angular, with a good deal of hair (loosely clustered or rarely closely stellate), usually eglandular. Prk. only moderately strong, broad-based, very sharp, nearly patent. L. 5-nate-digitate, rather yellowish-green. Lts. thick, normally with compound incised and partly patent toothing, opaque and thinly strigose above, *almost velvety-soft beneath* with greenish felt and shining white hairs; term. oval (often roundish in sunny places), with moderate or long acuminate point, emarginate or entire base, and rather short stalk. Pan. elongate, *truly pyramidal*, as it opens into fl. narrowing considerably above, *with close 1-3-flowered patent branches in the fairly long ultra-axillary part*; rach. and ped. closely felted and hairy, with slender declining prk. and usually a good many unequal stkd. gl., only a few of which exceed the hair. Sep. subpatent on fall of pet., afterwards loosely reflexed. Pet. oval, pale pink. Stam. rather short, but exceeding sty. Carp. glabrous, or nearly so.

Set, Nos. 37 and 86. Wood borders, heaths and hedges. Pretty generally distributed.

V.C. in G. Britain 34 [3]. Irish Co. II.

S. Sweden! Denmark. N. and W. Germany! Belgium. N. France.

A beautiful bramble, intermediate between *R. villicaulis* and *R. leucostachys*. Usually constant, and very easily recognised; but forms occur with more finely pointed and nearly even toothing, with eglandular pan., or with densely hairy st. Even these however may as a rule be readily distinguished from allied species by the singularly soft under-surface of the l. and the pyramidal pan. The small form, described in *Journ. Bot.* 1892, 233, as var. *Eifeliensis* Wirtg., is now considered by Dr. Focke to be 'only a poor ground state' of *R. pyramidalis*. In shade the lts. often become quite narrow, with rhomboidal base.

Specimens in my hb. of Mr. Briggs' collecting from three separate S. Devon localities have been confidently named *R. macranthelos* Marss. by Mr. O. Gelert, and seem indistinguishable from specimens collected by him in Marsson's locality in Pomerania. Marsson's plant is placed by Dr. Focke as a subordinate form under *R. pyramidalis* and considered by him to be intermediate between it and *R. pallidus* Wh. & N. It differs from *R. pyramidalis* by its rounder st. with weaker prk., cuspidate subrotund term. lt., long pan.-branches, more glandular rach. and patent frt.-sep.

c. St. densely hairy; its prk. long, usually with some sunken pricklets, acic. or stkd. gl. L. very softly hairy.

(i.) Pan.-prk. long, strong, subulate.

47. *R. leucostachys* Schleich. in *Sm. Eng. Fl.* ii. 403 (1824); not of Douglas. *R. vestitus* Wh. & N. (1825). St. climbing or arcuate-prostrate, bluntly angular, *densely felted and hairy*, sometimes with sunken pricklets or a few acic. or stkd. gl., weakly pruinose in autumn. Prk. long, *nearly straight*, short and crowded at base of st. L. 5-nate-pedate and digitate. Lts. broad, usually rather small, *wavy at edge*, with *nearly simple even shallow teeth*, strigose and shining above, *softly yellowish* or

grey-felted and hairy beneath, often green in shade; term. *subrotund-cuspidate*, with entire or emarginate base, about $2\frac{1}{2}$ times as long as its stalk, rarely oval in shade. Pan. long, cylindrical, with rather close nearly patent cymose-flowered branches, and often some simple l. above; rach. and ped. densely villous-felted, with prk. chiefly long and straight (rarely falcate) and often a few stkd. gl. Sep. clothed like rach., normally reflexed after fall of pet. Pet. roundish, bright pink or white. Stam. white or pink, only slightly exceeding sty. Frt. sweet, but insipid. Carp. glabrous, or nearly so.

Set, No. 119. Rough banks, wood borders, etc. Very widely spread; preferring soils having some admixture of lime in them.

V.C. in G. Britain 69. Irish Co. 19.

Guernsey, Jersey and Sark; in quantity, but hardly typical!

Denmark! W. Germany! Belgium! Switzerland. Austria. France!

Naturalised in New Zealand! 'Not uncommon, and in some districts has become a great nuisance' (T. Kirk in litt. 1895).

Very variable, but seldom hard to recognise;—the densely felted and hairy st. and rach., long straight prk., cylindrical pan. and roundish pet. being remarkably constant features. The roundish softly felted lt. is also quite normal, rarely giving place to an oval unfelted one except in shade. According to Weihe and Nees the red or bright pink pet. are found on clay soils and the white on lime; and Dr. Focke thinks that at all events the red pet. always indicate a rather impenetrable soil. The var. *angustifolius* of *Journ. Bot.* 1892, 234, is considered by him to be clearly most allied with his *R. lasioclados*. It will accordingly be found described below under that species. *R. conspicuus* P. J. Muell. (= *R. vestitus* Bab.) is omitted as apparently non-British (see *Journ. Bot.* 1895, 80).

Var. *gymnostachys* Genev. in *Mém. Soc. Acad. M. & L.* 28 (1861). Incl. *R. macrothyrus* J. Lange and *R. macrothrysus* N. E. Brown. Its. small, usually with compound teeth, glabrous or subglabrous above; term. oval-obtusangular. Pan. with elongate narrow ultra-axillary top, usually with several simple l. and branches (mostly 2-3-flowered) of nearly equal length; rach. and ped. with slender declining prk. (partly acicular, partly stronger) and sometimes stkd. gl. and acic. Pet. oval or slightly obovate, pink.

Set, Nos. 14 and 87. In rough bushy ground and thickets. In several western counties from Somerset and Dorset to Flint and Carnarvonshire.

V.C. in England and Wales 8. Irish Co. [1].

Denmark. Germany! Belgium. Switzerland. Austria. France.

As variable as the type;—the strong large-flowered highly glandular Bangor plant (Set, No. 87), which approaches *R. Boraeanus* Genev., being connected with the slender nearly eglandular Kern Bridge form (Set, No. 14) by the intermediate forms of other counties.

(ii.) Pan. prk. mostly weak.

Somewhat intermediate between *R. leucostachys* and *R. micans* comes a handsome bramble, apparently far from rare in S. England, which is near *R. leucanthemus* P. J. Muell., though (it would seem from Genevier's description of that species) not identical with it. In its densely hairy st. and the roundish shape of its lts. it strongly recalls *R. leucostachys*; but its prk. are mostly much weaker than in that species, its leaf-tothing more compound and finely incised, its term. lt. less cuspidate and its pan. laxer, with rather rigid patent-erect branches above, a more truncate top, white oval pet. and loosely reflexed or subpatent sep. The plant as a whole is softly hairy, but nearly or quite eglandular, and though the prk. are rather unequal and scattered, there are few or no short pricklets. It seems a fairly frequent form in Surrey; and I have specimens, nearly

or quite identical, from Devon, Dorset, Hants, Berks, Radnorshire and Co. Mayo and Galway.

For *R. vestitiformis* subsp. nov., intermediate between *R. leucostachys* and *R. anglosaxonicus*, see below, p. 58, under the latter species.

(iii.) Pan.-prk. crowded, partly falcate. Frt.-sep. patent or sub-patent.

48. *R. lasioclados* Focke, *Syn. R. G.* 198 (1877). *St. with dense mat of felt and long hair*, often with some scattered small pricklets or stkd. gl., somewhat pruinose. Prk. falcate and declining, with very stout long base. L. chiefly 5-nate-pedate. Lts. with rather irregular incised teeth, thinly strigose above, whitish-felted and hairy beneath; term. oval or roundish. Pan. strongly developed, broadly cylindrical, with rather close patent-erect cymose-corymbose and often many-flowered branches; rach. and ped. densely hairy and felted, with crowded slender large-based falcate and declining prk.; the long hair at base of sep. yellowish. Frt.-sep. subpatent. Pet. large, white. Stam. and sty. subequal.

Not in Set. Distribution little known. A Kent plant (E. and W.) has been so named by Dr. Focke, and I consider that I have seen it from three other English counties.

Germany.

R. lasioclados differs from *R. rusticus* by long hair on st. and rach., the mixture of falcate with straight prk. on st., more hairy l., more prickly pan., white pet. and subpatent frt.-sep. Thus in several features it goes off from the latter species towards *R. leucostachys*, from which it may readily be distinguished by its stout-based curved prk., somewhat pruinose st. and whitish felt. It has probably arisen from a crossing between those two species, and my var. *angustifolius* seems a modified but easily recognised form. Whether these two plants can be kept distinct from each other as type and var. may be open to some doubt. I can hardly give a decided opinion without seeing more of the type. The var. is certainly far the more abundant form in England and Wales, and so very common locally and so widely distributed that it seems no longer possible to treat it as an ordinary hybrid freshly produced by crossing in each instance. Cf. *Journ. Bot.* 1894, 45; 1895, 80.

Var. *angustifolius* Rogers, *Journ. Bot.* 1892, 234; not of Kaltenbach, nor of Mueller and Lefvre. St.-prk. chiefly patent; those of pan.-rach. partly declining, partly falcate. Lts. remarkably long and narrow, with nearly parallel sides and acuminate or cuspidate-acuminate point, yellowish-grey or ashy felt beneath, and very shallow and partly recurved teeth; term. long stalked. Pan. usually laxer and pet. pink. Frt.-sep. somewhat patent or even erect.

Not in Set. Bushy places, commons and hedges. Frequent and locally common from Devon and Kent to Berks and Merioneth.

V.C. in England and Wales 20. Irish Co. 1.

Guernsey! Jersey!

GROUP VIII. EGREGII. See pp. 4, 12.

SECT. 1. Bas. lts. distinctly stalked even in summer. (*Adenophori petiolulata* Focke.)

a. St. densely hairy, glaucous. About $\frac{1}{3}$ of pan. ultra-axillary.

49. *R. criniger* Linton, *Journ. Bot.* 1894, 108 (*R. Gelertii* Frider. var. *criniger*). St. densely hairy and pruinose, with crowded sessile glands,

a few very scattered sunken ones, and occasionally some pricklets. Prk. rather unequal, slender, declining, nearly confined to angles. Ls. chiefly 5-nate-pedate, greyish-green. Lts. not imbricate, concave, long-pointed, irregularly lobate-serrate, with wavy edge, strigose above, ashy-felted with prominent ribs beneath; term. ovate-acuminate, with entire or emarginate base, often unequal-sided. Pan. with rather long ultra-axillary part remarkably narrowed to the small truncate top, with long lower branches like secondary pan.; rach. and ped. with ashy felt and patent hair hiding most of the very unequal stkd. gl. and small acic.; prk. long, slender, often strongly declining, sometimes falcate or hooked. Sep. rather loosely reflexed, often aciculate and glandular. Pet. narrow, rather small, pinkish. Stam. exceeding sty. Young carp. hairy.

Set. No. 89. (The Yeldersley plant typical; the Edge Park one an allied form.) Woods and bushy places. Frequent (in the typical form) from Kent and Herefordshire to Norfolk and Derbyshire.

V.C. in England 10 [1]. Irish Co. 1. Endemic?

As described above an exceedingly well-marked and fairly frequent British bramble; but allied forms occur and increase the difficulty (which would exist without them) of deciding where best to place *R. criniger*. On the whole it seems most at home among the *Egregii*, as one of the more glandular forms of that complex group. In spite of its densely hairy and highly pruinose st. and more glandular and hairy pan., it decidedly recalls *R. Gelertii* and (in a less degree) *R. Leyanus* and *R. Drejeri*; but it also shows considerable resemblance to the sub-Bellardian *R. scaber*, though sufficiently separated from it by its Egregian armature, lobate-serrate and long pointed lts. and laxer more pyramidal pan. The Edge Park plant (one of the two issued to represent *R. criniger* in the Set. No. 89) goes off from the type towards *R. adenanthus*; but in Herefordshire there seem to be forms intermediate between it and the type,—in addition to the type.

b. St. moderately or rather considerably hairy. From $\frac{1}{2}$ to nearly $\frac{1}{2}$ of pan. ultra-axillary.

(i.) Ls. with wavy edge and compound teeth. St. with scattered pricklets, tubercles and stkd. gl. on faces.

50. *R. adenanthus* Boul. & Gill. *Assoc. Rub. Ann.* No. 429 (1881). *Journ. Bot.* 1898, 87, 88. St. bluntly angular, striate, fuscous, with many hairs nearly hiding the very scattered unequal short stkd. gl. acic. and pricklets. Prk. mostly long and straight, but rather unequal and only partly confined to the angles. Ls. 3-5-nate-pedate and 5-nate-digitate, greyish-green. Lts. shortly stalked, partly imbricate, strigose above, ashy-felted and thinly hairy beneath, with very compound open incised teeth; term. broadly oval or slightly obovate, with long acuminate point and rather narrow shallowly emarginate base. Pan. long, moderately lax, with one or more simple l. above, subpyramidal-corymbose, the top-most branches 1-2-flowered, the rest patent-erect cymose; rach. and ped. with many slender falcate and declining prk. and crowded villous hairs hiding the many unequal acic. and stkd. gl., hardly felted. Sep. often aciculate, with sunken glands and long points ascending on fall of pet. Stam. rather short, but exceeding sty. Young carp. glabrous or thinly hairy.

Not in Set. Jersey! France!

The above is a description of the Gorey Bay (Jersey) plant, named by Dr. Focke and recorded by me in *Journ. Bot.* 1898. I have seen no British plant identical with it, but (as I have stated above under the last species) the Edge Park (Cheshire) plant issued in the Set. No. 89, as one of two forms representing *R. criniger*, really seems to be intermediate between *R. criniger* and the Gorey Bay *R. adenanthus*. The

latter has the 3-5-nate greyish-green almost lobate-serrate l. of *R. micans*, approaching that species also in its very hairy st.; but the term. lt. is more nearly roundish and more gradually acuminate and the st. has its hair looser. Thus in st. and l. *R. adenanthus* and *R. criniger* recall *R. micans*, though in other respects diverging from it towards the *Radulæ*. The bas. lts. in the Gorey Bay plant seem very shortly stalked (perhaps too shortly for the *Petiolulati* section of the *Egregii*); but I saw the bushes no later than July 13th, when the l. were hardly mature.

51. **R. Boræanus** Genev. in *Mém. Soc. Acad. M. & L.* viii. 87 (1860). St. bluntly angled, striate or subsulcate, with many scattered clustered hairs, *not* felted; stout-based pricklets usually many; acic. and stkd. gl. variable. Large prk. nearly confined to angles, large-based, declining or slightly falcate. L. 5-nate-pedate and 3-nate. Lts. wavy at edge, with compound broad teeth, rarely almost lobate-serrate, wrinkled and strigose above, *ashy-felted* and *hairy* beneath; term. long-stalked, broadly obovate-acuminate or roundish cuspidate-acuminate, with entire or emarginate base. Pan. normally cylindrical for its whole length, with all the branches rigid and strongly ascending, the central fl. of their irregular cymes long-pedicelled, the primordial fl. of the pan. nearly sessile and usually exceeded by the topmost branches; the *ultra-axillary part*, with one or more simple or 3-fid l. at its base, usually fairly long, mostly with 2-3-flowered close branches, *nearly* or *quite* unarmed; rach. ped. and sep. *ashy-felted* and *hairy*, with a few unequal chiefly sunken glands and acic. Sep. rising on fall of pet., becoming loosely reflexed later. Pet. (rather small) and sty. *purplish-red*. Stam. barely equaling sty. Young carp. hairy.

Set. No. 61. Hedges and bushy places. In the typical form locally abundant only in a few English counties.

V.C. in G. Britain 7 [2]. Irish Co. 1. Guernsey! Jersey!

Brittany! Normandy!

A striking and readily recognised bramble when typical, as in S. Devon, a few other English counties and the Channel Islands; but in some of its forms not easily distinguished from allied species. The st.-armature varies greatly, as is usual in the *Egregii*; but the numerous stout-based pricklets on the faces are always a marked feature, and in conjunction with the almost unarmed pan.-rach. and rigid ascending branches, with small deep red fl., generally remove all difficulty in identification.

N.B.—For *R. curvidens* A. Ley and *R. vestitiformis* subsp. nov., which in Conspectus of Species follow *R. Boræanus* Genev., see below under *R. anglosaxonicus* Gelert, p. 57.

(ii.) L. with shallow even teeth. St. with few or no stout-based pricklets. Acic. and stkd. gl. variable.

(*R. pulcherrimus* Neum.) See Group III., *Rhamnifolii*, p. 32.

52. **R. cinerosus** Rogers in *B. E. C. Rep.* 1896, 513. *Journ. Bot.* 1899, 195. *R. pulcherrimus* Neum., var. *setosus* A. Ley ms. (not of Bigel). St. very bluntly angled or roundish, fairly hairy, fuscous, with many unequal but mostly very small pricklets, acic. and bristles and a few stkd. gl. Large prk. strong, usually nearly equal and declining, rarely falcate. L. 5-nate-digitate. Lts. usually imbricate, with broad shallow even teeth, opaque and thinly strigose above, with close ashy felt and rather few hairs beneath; term. roundish-obovate, with moderate cuspidate-acuminate point, emarginate base and short stalk (often barely $\frac{1}{4}$ its length). Pan. rather broadly cylindrical; nearly half ultra-axillary, with patent mostly few-flowered branches and truncate or slightly rounded top; simple l. often wanting, rarely more than one; rach. and ped. *ashy-felted*, densely villous, with many very slender patent or sub-

patent prk., often passing into acic. or mere bristles; *stkd. gl. crowded and mostly sunken*, with a few glandtipped bristles exceeding the hair. Sep. ashy-felted and villous, sometimes glandular and aciculate, loosely reflexed in frt. Pet. roundish-ovate, rather small, pinkish. Stam. exceeding sty. Young carp. glabrous or thinly hairy.

Not in Set. Woods, thickets and open commons. Widely distributed, from Hants and Kent to Yorkshire, Herefordshire and Radnorshire. Only locally abundant.

V.C. in England and Wales 10 [1]. Irish Co. 2. Endemic?

R. cinerosus so clearly recalls *R. pulcherrimus* in several of its more marked features that it seems hardly satisfactory to place them far apart, in spite of the very great difference in armature, glandular and acicular development, and shape of pan. Somewhat intermediate forms (nearer to *R. pulcherrimus* than to *R. cinerosus*) do occur, but apparently very rarely. On the other hand it is hardly possible to keep such a form as *R. cinerosus* among the *Rhamnifolii*, where *R. pulcherrimus* seems more at home than in any of the glandular groups; and if the two forms are separated a place more suitable than this among the *Egregii* can hardly be found for the more glandular plant.

53. *R. mucronatus* Bloxam in *Kirby*, 43 (1850); not of Seringe. *R. mucronulatus* Bor. St. arcuate-prostrate, bluntly angular or roundish, densely hairy below and rather considerably so above, with many or few small acic., bristles and stkd. gl. and occasionally some small tubercular pricklets. *Prk.* usually few, slender, patent or declining. L. mostly 5-nate-pedate. *Lts.* often imbricate, thin (in type), wrinkled and very strigose above, paler and softly but rather thinly hairy beneath, with simple shallow even teeth; *term.* broadly roundish-ovate, with short abruptly cuspidate point and cordate base, about 3 times as long as its stalk. *Pan.* rather long, nearly cylindrical, very lax below with strongly ascending few-flowered branches, nearly or quite racemose above with long patent-erect ped., rarely more compound throughout; *rach.* and *ped.* densely felted and hairy, with rather few very slender declining prk., and many or few slender unequal acic., bristles and stkd. gl. Sep. with long hair and narrow pale margin, rising on fall of pet., but soon becoming only subpatent or loosely reflexed, often glandular and aciculate. Pet. pinkish. Stam. exceeding sty.; both reddening after a time. Young carp. glabrous or thinly hairy.

Set. No. 88 (the Warwickshire specimens only typical; the Dorset ones representing var. *nudicaulis*). Bushy places, heaths and hedges. Very widely distributed through the British Isles, and yet often absent where other species abound. Perhaps most abundant in Scotland.

V.C. in G. Britain 57 [2]. Irish Co. 6.

N. Germany! France. ?Portugal.

A natural and usually easily recognised species, in spite of its considerable range of variation. Very happily described in *Bab. Rub.* The broad truncate-cuspidate term. It.—the character to which the species owes its name,—occasionally gives place to a rather narrow and more acuminate one; and in an extreme form of this kind discovered by the Rev. A. Ley in a wood near Presteign, Radnorshire, and in N.-W. Herefordshire, and which he has distinguished by the ms. name *R. mucronatoides*, this character is associated with large lilac-tinted fl. and a more straggling pan. in which the long sep. are strongly reflexed and the topmost branches greatly exceed the very shortly pedicelled primordial fl. But this extreme form seems connected with the type by other intermediate ones in the British Isles, as also to some extent by a plant which Dr. Focke describes as the ordinary *R. mucronatus* form of the west Baltic coast.

R. oigocladus Muell. & Lefv., or rather the British plant to which we

are provisionally giving that name (see below, p. 65), may be distinguished from *R. mucronatus* by its pruinose and more Radulan st., narrower and much more obovate lts., narrower pan., strongly reflexed sep. and closer felt on rach. and sep. with crowded very short blackish stkd. gl. In some respects intermediate between these two comes *R. podophyllus* P. J. Muell. (see below p. 67); though it differs from both in its scattered and more unequal prk., oblong-obovate lts. with some principal teeth patent, and slender pan. narrowed above, with crowded acicular prk. and rather small greenish-white pet.

c. St. glabrous or subglabrous.

(i.) Pan. normally as in Sect. *b.* (i.e. $\frac{1}{3}$ to nearly $\frac{1}{2}$ ultra-axillary).

(1) L. pale green and very softly hairy beneath.

nudicaulis var. nov. A strong form differing from typical *R. mucronatus* by st. glabrous or subglabrous, furrowed, usually far less bristly and glandular, though with longer and more numerous prk.; l. more frequently 3-4-nate; lts. large, much thicker, convex, almost velvety soft beneath, with dense short shining hairs, the cuspidate point usually longer and the teeth compound and rather deeply incised; pan. with more compact and more nearly patent-branched ultra-axillary part, handsome cuplike fl., pet. usually white (rarely bright deep pink) and sep. either erect or patent with young frt. Most of the l. are 3-nate with gibbous-based lat. lts. and very prickly petiolules. Sep. (without pale margin) and ped. with greyer felt than in type.

Set. No. 88 (Dorset specimens only). Heaths and bushy places. A very common form in Dorset and S. Hants and extending into S. Wilts, apparently to the exclusion of the typical plant.

V.C. in England 3 [1]. Endemic?

(2) L. normally grey-felted beneath, especially when young.

a. Sep. reflexed in fl. and frt., sometimes only loosely.

54. *R. Gelertii* Frider. in Bot. Tidsskr. xv. 237 (1886). St. arcuate-prostrate or climbing, angular, subsulcate, glabrescent, with a few inconspicuous acic. glands (sessile and stkd.). Prk. mostly long and slightly declining, subequal, nearly confined to angles. L. large, 5-nate-pedate and digitate. Lts. subcoriaceous, strigose-glabrescent above, normally ashy-felted and thinly hairy beneath when young, irregularly dentate-serrate, usually with incised compound and partly recurved teeth in the upper half; term. broadly oval, with rather long acuminate point and cordate or subcordate base, about 3 times the length of its long stalk. Pan strongly developed, with large l., broad round-topped ultra-axillary part, with many-flowered cymose branches and usually one or more simple or 3-fid l. above, and long distant strongly ascending branches like secondary pan. below; rach. and ped. with dense grey felt and (normally) rather short dense patent hairs, with few or many acic. and short stkd. gl. and many declining (and often a few falcate) prk. Sep. reflexed in fl. and frt., though sometimes only loosely. Pet. normally white. Stam. exceeding sty. Young carp. thinly hairy or glabrous.

Not in Set. Plants almost identical with the Schleswig type occur in widely separated localities in E. Sussex and on Reigate Hill, Surrey (the latter seen and accepted as *R. Gelertii* by Mr. Gelert). Nearly allied forms, which can hardly be held to be specifically distinct, have been found in several other counties.

V.C. in G. Britain 4 [5]. Irish Co. 1.

N.-W. Germany!

A strong handsome bramble somewhat intermediate between *R. pulcherrimus* and *R. anglosaxonicus*; the lts. especially, when typical, recalling those of the latter species, though usually broader and not nearly so parallel-sided. Our English plant closely resembles the type in

most particulars, but it has l. less constantly felted beneath when young and rather more hairy; while on the other hand the close grey felt on pan.-rach. and ped. is more conspicuous in the English plant because in it the additional patent hairs are more thinly placed.

β. Sep. partly subpatent or even erect with young frt.

R. raduloides Rogers. Prk. and acic. many, very unequal. Lts. with incised compound finely pointed teeth; term. broadly ovate-acuminate. Ultra-axillary pan.-top long, cylindrical.

For full description of this and the next see below under *R. anglosaxonicus* Gelert, p. 58.

R. setulosus Rogers. Usually still more prickly and glandular than the last, the armature in extreme examples being quite Koehlerian. Term. lt. obovate-obtusangular. Pan. more leafy above, laxer below.

(ii.) About $\frac{1}{2}$ of pan. ultra-axillary.

55. **R. anglosaxonicus** Gelert in *Bot. Tidsskr.* xvi. 81 (1888). St. angular, subsulcate, *glabrescent*, purplish-red, *shining almost as if varnished*, with a good many scattered pricklets; stkd. gl. and slender acic. few or none. Prk. very strong, stout-based, nearly patent, subequal, almost confined to angles. L. 3-5-nate-pedate; often very large. Lts. thick, coriaceous, coarsely irregularly serrate, subglabrescent above, ashy- or greenish-felted and rather thinly hairy beneath; term. long, narrow, oval, with nearly parallel sides, short point, and emarginate base; 3 to $3\frac{1}{2}$ times the length of its stalk. Pan. usually rather short, narrowing above, leafy almost to the top, with strongly ascending 1-3-flowered branches and often several simple and 3-fid l.; axillary l. large, 3-nate, far exceeding the longest branches; rach. and ped. ashy-felted with short hair, many bristles acic. and stkd. gl. (rarely exceeding the hair) and some rather weak declining prk. Sep. subpatent on fall of pet., loosely reflexed later. Pet. usually pinkish. Stam. exceeding sty. Young carp. thinly hairy.

Set. No. 19. Hedges and bushy places, especially on stiff clayey soils. From Cornwall and Kent to Derby and Carnarvonshire, frequent.

V.C. in England and Wales 21 [3]. Irish Co. 1.

N.-W. Germany! Brittany!

Almost intermediate between *R. macrophyllus* and *R. radula*. Distinguished from *R. melanoxyylon* Muell. & Wirtg. at once by the long narrow term. lt. with its coarse toothing and the subequal large prk. on st.-angles; and from *R. micans* Gren. & Godr. by the shining glabrescent st., reddish tint of st. and rach., strongly ascending pan.-branches and sep. rising on fall of pet., as well as by the characteristic narrow lts. with coarse irregular teeth and short point.

Subsp. *curvidens* A. Ley in *Journ. Bot.* 1894, 143. St. high-arching, bluntly angled, rarely subsulcate, considerably hairy, often slightly pruinose; slender pricklets acic. and stkd. gl. very variable in quantity, usually few. Large prk. decidedly unequal, not quite confined to angles, declining. L. large, 5 nate-digitate or pedate. Lts. oblong-obovate, often with nearly parallel sides, slightly strigose above, much paler and thinly hairy beneath, very coarsely crenate-serrate, with many of the large teeth recurved, rarely imbricate; term. with fairly long acuminate or slightly cuspitate-acuminate point, subcordate base, and stalk about $\frac{1}{3}$ its length; interm. and bas. very similar in shape. Pan. usually large and very lax, cylindrical with broad top, often ultra-axillary for about $\frac{1}{3}$ its length, but not unfrequently with several large simple grey-felted l. above; rach. ped. and sep. with yellowish-grey felt and loose hairs hiding most of the many stkd. gl. and short bristles or acic.; prk. many, mostly long, declining; branches long, ascending, racemose-corymbose, usually few.

flowered. Frt.-sep. rather loosely reflexed. Pet. large, pink. Stam. exceeding sty. Carp. nearly or quite glabrous.

Set, No. 120. Woods and thickets. As yet found only in 3 Welsh counties with Herefordshire and Worcestershire; locally abundant.

V.C. in England and Wales 5 [r]. Endemic?

A very handsome plant, which seems just intermediate between *R. calvatus* Blox. and *R. anglosaxonicus* Gelert; in l. and laxness of pan. nearer to the former, in armature and colour more nearly recalling the latter. It thus stands to *R. calvatus* in much the same relation that *R. cinerosus* does to *R. pulcherrimus*. In armature showing an even greater range of variation than *R. Boreanus*.

vestitiformis subsp. nov. St. bluntly angled, *considerably hairy, glaucous*, dark purple. Prk. many, mostly short, rather scattered, chiefly patent, with a few declining and falcate ones intermixed, *very stout-based*. Prklets very unequally scattered, often reduced to a stout cushion-like base. Stkd. gl. and acic. *very few or none*. L. 3-5-nate-pedate, coriaceous and felted beneath as in the type, but shorter, more strigose above and with shining white hairs in addition to the felt beneath; term. lt. roundish or roundish-obovate cuspidate. Pan. with longer lower branches and a long cylindrical ultra-axillary top with nearly patent few-flowered subcymose branches; rach. and ped. coloured like the st., felted and *densely villous*, with many prk. (falcate and declining) sunken stkd. gl. and acic. Sep. reflexed throughout, conspicuously white within. Pet. pink. Stam. far exceeding sty.

Not in Set. Woods and bushy places. Very abundant locally in S. Herefordshire and W. Gloucestershire. Endemic?

A very hairy plant. The name *vestitiformis*, suggested by the Rev. A. Ley, is particularly appropriate to this form, as it seems exactly intermediate between *R. leucostachys* Schleich. (*R. vestitus* Wh. & N.) and *R. anglosaxonicus*. In some respects it also recalls *R. clivicola* and *R. Babingtonii*, while readily distinguishable from them by the characters given above. In W. Kent I have seen a form which goes some way towards connecting this subsp. with the type.

Subsp. *raduloides* Rogers in *Journ. Bot.* 1892, 209. St. very strong, like that of *R. anglosaxonicus*, but usually more furrowed, glabrous, and *thickly clothed with long unequal prk. and acic.*, some of the latter being occasionally glandtipped. L. usually 5-nate. Lts. with sharper, more incised, compound teeth, more softly hairy with paler felt beneath and the stalks more prickly; term. broader, ovate or obovate, with longer point. Pan. with long cylindrical ultra-axillary top and nearly patent branches. Pet. bright pink. Whole plant far more prickly and aciculate, though not always more glandular.

Set, No. 62. Bushy and stony places; widely distributed and fairly frequent. From Somerset, Dorset, and Kent to Flint.

V.C. in England and Wales 15. Endemic?

Although standing nearly midway between *R. anglosaxonicus* and *R. Koehleri*, and therefore looking somewhat out of place in any of our groups, the position of this form here seems to be justified by the fact that, where it occurs, plants are occasionally found clearly intermediate between it and typical *R. anglosaxonicus*. From *R. radula* it may always be readily distinguished by the very mixed unequal st.-armature and the more cylindrical pan. with sep. rising on fall of pet.

Subsp. *setulosus* Rogers in *Journ. Bot.* 1892, 209 (not of Mueller and Lefvre). *R. infestus* of many British authors. St. bluntly angular, deeply striate, bright red, glabrous or somewhat hairy, still more densely covered with very unequal, stout-based, partly falcate prk. and acic. and usually a good many stkd. gl. Term. lt. obovate-obtusangular or

rhomboidal, gradually acuminate, with close even and usually shallow teeth, and cuneate-emarginate or entire base. *Pan.* very lax below, narrowing considerably above, usually with many narrow simple l. and densely prickly aciculate villous rach. *ped.* and *sep.* *Pet.* narrow. Young carp. very hairy or subglabrous.

Set. No. 121. Bushy hillsides and thickets. Apparently less widely distributed than the last, but far more abundant in Herefordshire, and occurring in several other western counties, in Oxfordshire and (a form) in Leicestershire.

V.C. in England and Wales 8. Endemic?

Very conspicuous from the great contrasts of colour in st. and foliage. Distinct as this usually is from subsp. *raduloides*, and still more Koehlerian, plants occur near Chase Wood, Ross, Herefordshire, which go far to connect the two forms with each other as well as with typical *R. anglosaxonicus*.

56. *R. melanoxylon* Muell. & Wirtg. in *Hb. Rub. Rhen.* ed. i. n. 181, (1861); not of Babington. (*Journ. Bot.* 1897, 47.) *St.* strong, furrowed, nearly glabrous or glabrescent, with blackish-brown or dark purplish-brown bloom. *Prk.* acic. and stkd. gl. variable; often crowded and unequal; some of the *prk.* always strong and stout-based. *L.* chiefly 5-nate-pedate. *Lts.* with close even teeth, strigose above, paler with prominent ribs and short shining hairs or greyish felt beneath; *term.* roundish-obovate or oval, usually narrowing gradually to short point, with subcordate base, about three times as long as its stalk. *Pan.* long, nearly cylindrical, with distant ascending cymose-umbellate branches below and 1-3-flowered ones above; *rach.* coloured like *st.*, rather flexuose, felted only at top, thinly hairy, usually with very unequal *prk.*, acic., bristles and stkd. gl.; the largest *prk.* long, strongly declining, very rarely somewhat falcate. In the stronger plants only are many of these unequal arms glandtipped. *Sep.* with greyish-green felt, often glandular and aciculate, patent or subpatent in frt. *Pet.* narrow, pink. *Stam.* exceeding *sty.* Young carp. slightly hairy.

Not in Set. Heaths and moist bushy places. Frequent in several Scottish counties. Found also in one Herefordshire locality, and in one or more Welsh counties.

V.C. in G. Britain 6 [3].

Germany. France!

Evidently an ill-defined species, as Dr. Focke has told us, and as has been clearly proved by the great range of variation in the British plants to which the name has at different times been applied; but the handsome form, at least locally abundant in Scotland, which I have described above, and which is 'more like the original specimens than anything else met with under this name' by Dr. Focke, is decidedly well marked and easily recognised, in spite of its very variable armature. In the living bushes this recalls the more strongly armed forms of *R. mucronatus*, while in some respects intermediate between them and *R. villicaulis* on the one side and *R. rosaceus* on the other. But the shape and toothing of the *term.* *lt.* and the blackish-brown colour of *st.* and *pan.-rach.* are very remarkable and distinctive.

SECT. II. Bas. lts. almost sessile in summer, with stalk becoming a little longer in autumn. (*Adenophori subcorylifolii* Focke.)

a. St. usually subglabrous. Sep. patent or erect on fall of pet. (Often sub-Koehlerian in armature.)

57. *R. infestus* Weihe in *Boenn. Prodr. Fl. Monast.* 153 (1824); not of Hartman and many other authors. *R. tæniarum* Lindeb. *St.* declining from a rather high arch, strong, mostly subglabrous with us, but often

more hairy on the Continent; below flat-sided, with nearly equal prk.; above furrowed, usually with many unequal pricklets acic. and stkd. gl. on the faces, and strong subequal long-pointed very stout-based falcate and declining prk. on angles. Ls. sharply unevenly serrate; bright green, thinly strigose or glabrescent above; much paler, softly hairy beneath, and often greyish-felted when young; term. usually broadly obovate or ovate, with long point and subcordate or nearly entire base; bas. very shortly stalked. Pan. lax, compound, with cymose-umbellate branches below; the ultra-axillary part usually rather broad, corymbose, dense, sometimes with several simple l.; rach. moderately hairy, felted only at top, very strongly armed like st., but with some prk. more hooked and the smaller arms more glandular; ped. also very prickly and aciculate. Sep. greyish-olive, white-margined, usually glandular and aciculate, patent or erect in frt. Pet. pinkish. Stam. mostly exceeding sty. at first. Young carp. thinly hairy.

Set. No. 122. Chiefly in hedges and thickets. Widely distributed through Great Britain, though uncommon in most districts.

V.C. in G. Britain 28 [5]. Irish Co. 2.

Sweden. Denmark! Germany!

Apparently the only glandular sp. which in habit and sep. can be said strongly to recall the *Subrecti*. On the whole it seems to occupy a position among the *Egregii* analogous to that held among the *Silvatici* by R. Colemanni, the latter for a time having been named *R. infestus* by Bloxam, though not by Babington (see *Journ. Bot.* 1887, 332). Our average British *R. infestus* may be rather stronger and its st. more nearly glabrous than is usual in the continental plant; but in all essential features they are plainly identical. Some few spns. however, for which in former years I suggested this name, seem to me now to go off from typical *R. infestus* towards my var. *semiglaber* of *R. Marshalli* Focke & Rogers.

Var. *virgultorum* A. Ley (not of P. J. Mueller). *R. Borreri* Bell Salt., var. *virgultorum* A. Ley, *Journ. Bot.* 1894, 143. *Bot. Exch. Club Rep.* 1897, 544 (cf. note issued with Set. No. 123). Diverges from type (chiefly towards *R. Borreri*) in st. lower and bluntly angled or even roundish; prk. shorter, straighter, very rarely falcate; l. more crowded on st.; lts. roundish, with short point and rather close even teeth and pan. broadly cylindrical, with comparatively few prks. (falcate or hooked) and frt.-sep. only subpatent or loosely reflexed.

Set. No. 123. Open rough pastures and coppices. Locally abundant in the counties of Hereford, Salop, Monmouth and Worcester. Endemic?

On the whole apparently best placed under *R. infestus*, though it looks considerably different when growing, and at first I entirely agreed with Mr. Ley's proposal to associate it with *R. Borreri* Bell Salt.

R. *Leyanus* Rogers. St. shining, pale. L. usually 5-nate-pedate, soft and often grey-felted beneath, sharply evenly toothed. Pan. narrowing in the ultra-axillary top. (Subsp. of *R. Drejeri*. See below, p. 62.)

b. St. hairy.

(i.) Sep. reflexed in fl. and frt.

58. *R. uncinatus* P. J. Muell. in *Flora*, xli. 154 (1858). St. very bluntly angled, hairy, thickly clothed with slender acic. and stkd. gl. of varied lengths. Prk. and pricklets scattered, slender, mostly declining, from long base. Ls. thin, strigose above, slightly paler and thinly softly hairy (or in sunny places greyish-felted) beneath, with finely pointed compound teeth; term. obovate subcuneate, with fairly long acuminate point and narrow entire base; all the stalks and midribs with numerous slender falcate and hooked prk. Pan. narrow, cylindrical, with distant, short, few-flowered patent-erect lower branches, and a short ultra-axillary top with close patent 1-3-flowered branches; rach. and ped. densely

villous, with many almost wholly sunken stkd. gl. and crowded acicular falcate hooked and declining prk. Sep. narrow, attenuate, reflexed. Pet. white. Stam. exceeding sty. Young carp. thinly hairy.

Not in Set. In Britain known with certainty only in woods near Monmouth and W. Glost. Similar plants, hardly looking distinct, but needing further study, occur in the borders of the Forest of Dean and in one or two places in Bucks.

Germany. France!

The above description is made from the Rev. E. F. Linton's spns. collected in woods above Troy House, Monmouth, and determined by Dr. Focke as 'exactly the same as the original *R. uncinatus* gathered by Mueller in the fir-woods of S.-W. Germany.' Spns. of a *forma aprica* in Mr. Friderichsen's hb., collected from 'granite plateau, Vosges' by M. Pierrat, clearly represent the same species; though (as might be expected from the different habitat) they are much more strongly armed and have lts. greyish-felted beneath—characters which take them rather nearer to *R. infestus*.

(ii.) Frt.-sep. patent or erect.

59. *R. Borreri* Bell. Salt. in *Ann. Nat. Hist.* Ser. I. xv. 306 (1845); not of Bloxam nor of Babington. *St. long, nearly prostrate*, rather bluntly angled, striate, considerably hairy, yellowish-brown or fuscous; *pricklets, acic. and stkd. gl.* variable, chiefly short, usually abundant in lower part. *Prk. very crowded*, especially below, where they are mostly rather short, straight, with broad short base; above longer, chiefly falcate and sub-equal. *L. 5-nate.* *Lts. subcoriaceous; above opaque, yellowish-green, strigose; beneath much paler, soft, with short shining hairs, or ashy-felted, with prominent ribs; wavy-edged with compound finely pointed deeply incised teeth* (the largest often patent or recurved); *term. rather broadly obovate-cuspidate-acuminate*, considerably narrowed to the nearly entire base; *bas. nearly or quite as shortly stalked as in R. infestus*; petiole and petiolules densely armed with strongly falcate prk. *Pan. strongly developed*, usually cylindrical, rarely subpyramidal, with broad corymbose ultra-axillary top, and distant lower branches; *rach.* densely hairy, felted above, with many sunken and subsessile gl. and yellowish prk. (falcate, declining and occasionally hooked). *Sep. grey-felted, hairy, aciculate and glandular, patent or erect with young frt., often loosely reflexed later.* Pet. rather large, white or pinkish. Stam. exceeding sty. Young carp. glabrous or very thinly hairy.

Set. No. 38. Commons and hedges. Fairly frequent in the West and in Ireland. Not seen in any English county east of I. Wight, nor in the North.

V.C. in England and Wales 12 [1]. Irish Co. 5.

Guernsey! Jersey!

Easily recognised. Very distinct from the strong form of *R. Sprengelii*, with which for a time it was confused, and nearest to *R. infestus*, from which it may be readily distinguished by the nearly prostrate st., subequal prk., obovate-cuspidate incised term. lt. broad pan. and somewhat yellowish tint of st. and lts.

Var. *dentatifolius* Briggs in *Fl. Plym.* 121. *Journ. Bot.* 1894, 46. *St. almost eglandular*, furrowed, considerably hairy at first, glabrescent. *Lts. greener beneath and at first very softly hairy (not felted), much narrower, concave, coarsely dentate*, with the larger teeth rarely patent; *term. oval or somewhat obovate, with very long gradually acuminate point and subcordate or emarginate base.* *Pan.-rach.* hardly felted above, its acic. and stkd. gl. often more unequal than in type.

Set. No. 63. Heaths and roadside banks. Abundant in Devon, where the type is as yet unknown except near Torquay. Occurs also in E. Cornwall and Dorset, and perhaps in Berks and Westmeath. Endemic?

A well-marked var. in the extreme south-west of England. Rarely somewhat intermediate forms are found.

60. *R. Drejeri* G. Jensen in *Fl. Dan.* xvii. t. 3023 (1883). *Journ. Bot.* 1897, 48. St. bluntly angled, usually considerably hairy, dull fuscous, sub-pruinose; pricklets, acic. and stkd. gl. very unequally scattered, of various lengths. Prk. unequal, mostly short and strongly declining, rarely falcate. L. 3-5-nate-pedate. Its. thin, somewhat strigose above, slightly paler and sparsely hairy beneath, with shallow rather irregular teeth; term. roundish-obovate, shortly pointed, with narrow cordate or broader emarginate base; lat. of 3-nate l. gibbous; bas. of 5-nate l. shortly stalked. Pan. long, lax, narrow; usually with moderate, somewhat narrowed ultra-axillary part, sometimes with simple l. almost to the top; rach. flexuose, villous-felted, usually strongly armed; prk. slender, various, chiefly declining; acic. and stkd. gl. short, unequal, chiefly sunken. Sep. greenish-felted, shaggy, often aciculate and glandular, sub-patent or erect in frt. Pet. pink, paler externally. Stam. exceeding sty. Young carp. rather thinly hairy.

Not in Set. Wood borders, thickets and hedges. Distribution imperfectly known. Locally abundant in the West and North.

V.C. in G. Britain 13. Irish Co. 1 [1].

Denmark. Schleswig! Holstein!

Very variable in amount and character of armature. Allied to *R. melanoxylon* and *R. podophyllum*; but the former may be distinguished by its furrowed glabrescent st., blackish-brown tint of st. and rach., gradually acuminate evenly toothed Its. softly hairy or greyish-felted beneath, and less shaggy rach.; the latter by its radulan st.-armature, oblong Its., and close-felted or thinly hairy rach., with more acicular prk.

Subsp. *Leyanus* Rogers in *Journ. Bot.* 1895, 81; 1897, 48. St. shining, thinly hairy or glabrescent, yellowish-brown. Prk. all declining. L. often 5-nate-digitate. Its. rather thick, soft and often grey-felted beneath, with very even, sharply pointed, nearly simple teeth; term. broadly ovate, with long and gradually acuminate point. Pan. conspicuously pyramidal, with rather long, strongly ascending lower branches and considerable ultra-axillary part with very narrow truncate top. Rach. nearly straight. Sep. very narrow and long pointed.

Set. No. 64 (as '*R. Drejeri*'). Rough banks and woods. A rather frequent plant in the south-west from W. Cornwall and S. Wilts to Flint. May prove not uncommon in Ireland.

V.C. in England and Wales 18. Irish Co. 2 [1].

Dr. Focke has sent me spns. of this or a very nearly allied form from Bederkesa, N.-W. Germany.

Even more variable in armature than *R. Drejeri*, and usually distinguished from it easily by the characters given above, especially the shining light brown st., soft greyish-green, long-pointed, even-toothed Its. and pyramidal pan. I agree with the authors of *Fl. Heref.* in their later opinion (p. 520) that this is distinct from '*R. Purchasii* Blox.' (no longer found in its one Staff. locality), which was never described by Bloxam, and may have been a weakly armed local form of *R. Drejeri*.

Subsp. *hibernicus* Rogers in *Journ. Bot.* 1897, 48. St. as in subsp. *Leyanus*, but usually rather more hairy. Large prk. slender, often nearly patent. Its. very thin, shining and only very slightly hairy on both sides, with remarkably loose sinuate toothing; the more prominent teeth somewhat patent; term. roundish, with fairly long acuminate point and cordate or subcordate base. Pan. long, pyramidal, very lax, with rigid patent-erect branches; the ultra-axillary part narrowing greatly to its truncate racemose or subracemose top; rach. grey-felted above, with

very slender, nearly patent prk. acic. bristles and crowded stkd. gl. Pet. faintly pinkish. Frt.-sep. clasping, then loosely reflexed.

Not in Set. Locally abundant in the parishes of Saintfield, Aghaderg and Lisnagade, Co. Down. Endemic?

A well-marked plant as distributed to the members of the *Wats. Exch. Club* in 1893-1896. In some respects intermediate between *R. Drejeri* and subsp. *Leyanus*, but diverging from both towards *R. cognatus* N. E. Br.; from which some of the more strongly armed allied forms collected by Rev. H. W. Lett could with difficulty be separated but for the very shortly stalked bas. lts. of the stem l. In ordinary *hibernicus* however the alliance with *R. Drejeri* seems close, and the armature not more Koehlerian than in that.

GROUP IX. RADULÆ. See pp. 5, 14.

SECT. I. Stkd. gl. on pan.-rach. and ped. mostly sunken among the patent hairs; well-marked acic. usually few or none. Stkd. gl. and acicular organs on st. crowded.

a. L. with ashy or greenish-grey felt beneath.

61. *R. radula* Weihe in *Boenn. Prodr. Fl. Monast.* 152 (1824); not of Holuby. *R. villicaulis*, d. *glandulosus* Wimm. & Grab. *R. melanoxylon* Blox. St. strong, rather high-arching, climbing or prostrate, angular, somewhat hairy; the flat faces rough with short subequal prk., tubercles, acic. and stkd. gl. Prk. rather few, very strong, equal or very nearly so, confined to angles, declining or nearly patent. L. chiefly 5-nate-pedate, large. Lts. not imbricate, subcoriaceous, sharply, coarsely and unequally serrate, subglabrous or thinly strigose above, with close felt (whitish at first, ashy or greenish later) beneath; term. broadly ovate-cordate (or narrower with nearly entire base) gradually acuminate, long-stalked. Pan. showy, with considerable subpyramidal rather densely branched ultra-axillary top and very distant short branches below; rach. felted, with patent hairs, many sunken or nearly sunken unequal stkd. gl., some small acic., and strong, subulate, straightish prk. Sep. reflexed. Pet. usually pinkish. Stam. exceeding sty. Young carp. usually with few hairs.

Not in Set. Rough bushy places, hedges, etc. From S. Devon, N. Hants and Surrey to Sutherland; rare in the south, becoming more frequent northwards.

V.C. in G. Britain 43 [22]. Irish Co. 2 [2]. Jersey (weak form)!

Scandinavia! Germany! to France and Switzerland.

Usually the strongest of the glandular species, coming about midway between *R. villicaulis* and *R. Koehleri*. At once distinguished from the former and all its allies by the crowded short stkd. gl. and acic. on st. and rach., and from the latter by the absence of intermediate armature of various lengths. The term. It. recalls that of *R. affinis* or typical *R. villicaulis*, though usually broader and with longer point than in either; while the long, straightish rach.-prk. approach those of *R. leucostachys* and *R. Koehleri*.

Subsp. *anglicanus* Rogers in *Journ. Bot.* 1894, 47. St. very long, high-arching at first, soon prostrate, usually greenish even in exposure. Prk. many, weaker, somewhat unequal and not strictly confined to angles, rarely a little curved. Lts. narrow, greyish-green opaque with deeply impressed ribs above, rather finely and evenly toothed; term. obovate or oval, cuspidate-acuminate, with entire or slightly emarginate base and very long stalk (sometimes $\frac{1}{2}$ as long as lt.). Pan. very showy, usually nodding, lax throughout, nearly cylindrical, with most of the branches patent and the subulate prk. usually rather weak. Fl. large, starlike.

Sty. usually reddish, much shorter than the pinkish upright stam. Pet. pink, soon fading white.

Set. No 39 (as '*R. radula* Weihe'). Heaths and thickets. From Cornwall and Sussex to Derbyshire. Common in the south, where it may be said to represent the aggregate species. More thinly distributed northwards. A nearly allied form in 3 Scottish counties. Not yet found in Wales or Ireland.

V.C. in England 22. Jersey (locally abundant)!

Usually less stout than the type, though often very luxuriant. Distinct and constant in S. England and Jersey; rather more variable in the north.

Subsp. *echinatooides* Rogers in *Journ. Bot.* 1894, 46. *St. glabrous*. Prk. as in subsp. *anglicanus*, but a few occasionally stronger. *Lts. all obovate, with compound incised and partly patent teeth, greenish-grey felt beneath, cuspidate-acuminate point and entire or slightly emarginate base*. Pan. like that of typical *R. radula* in outline, but *far more prickly and having some falcate or hooked prk.* mixed with the subulate ones. St. and pan.-rach. dark purplish-red. Sep. rather loosely reflexed on fall of pet.

Set. No. 65. Commons, wood borders, etc. With much the same distribution as *R. radula* and usually more abundant.

V.C. in G. Britain 25 [4]. Irish Co. 6. Endemic?

In some respects intermediate between *R. radula* and subsp. *anglicanus*; but diverging from both towards *R. echinatus* and *R. anglosaxonicus*, var. *raduloides*, especially in leaf-toothing and the dark colour of st. and rach. L. sometimes chiefly 3-nate and much greener and less softly felted beneath.

Subsp. *sertiflorus* (P. J. Muell.)? ex Genevier in *Mém. Soc. Acad. M. & L.* xxiv. 96 (1868). *Journ. Bot.* 1892, 300. St. thinly hairy. Prk. chiefly shorter than in the other segregates, mostly *hooked or very strongly declining, with long broad base*. Lts. with greenish-grey felt beneath at first, green and thinly hairy later, *uniformly narrow, with fairly even, shallow, partly patent teeth; term. obovate-acuminate-cuneate, with narrow emarginate or entire base and moderately long stalk*. Pan. rather narrow, with patent or divaricate branches above; rach. densely villous-felted, with sunken glands and some hooked prk.; *lts. of large 3-nate l. remarkably cuneate*. Pet. small, bright pink within, much paler externally. Stam. pink, exceeding green sty.

Set. No. 90. Woods and wood borders. Counties of Herts, Hereford, Monmouth,? Dorset; locally frequent.

Placed here because of the radulan st.-armature; but in many respects plainly going off from *R. radula* towards *R. fuscus*. The name was suggested by Prof. Babington; but he is not responsible for its association with *R. radula*. I have seen no authentic continental specimens of Mueller's plant.

62. *R. echinatus* Lindl. *Syn. Brit. Fl.* ed. i. 94 (1829). *R. disceptus* P. J. Muell. *R. rудis* British authors up to 1886. St. strong, furrowed, hairy (often densely), with crowded sunken subequal acic. and stkd. gl., dark purplish. Prk. many, long, subequal, with rather broad short base, straight or slightly falcate, almost confined to the angles. L. 5-nate. Lts. thick, with very compound, sharply pointed, lobate-incised teeth, thinly strigose wrinkled and deeply impressed above, when young with velvety ashy felt beneath, when older with greenish-grey appressed felt; term. ovate or oval, with long gradually acuminate point, entire base and long stalk. Pan. long, narrow, cylindrical, usually leafy almost to the top, with one-flowered or few-flowered branches above; rach. with dense patent hairs, crowded unequal mostly sunken stkd. gl. and rather long

declining prk.; acic. few or none. *Sep. long-pointed, very strongly reflexed throughout.* Fl. rather showy. Pet. long, usually pink. Stam. unequal, mostly only slightly exceeding sty. Frt. elongate. Carp. glabrous or subglabrous.

Set, No. 40. Hedges, thickets, etc. One of our most frequent British brambles, from Cornwall to Elgin; but apparently less common in Scotland than in England or Ireland. Does not object to chalk.

V.C. in G. Britain 56. Irish Co. 5.

W. Germany (rare)! France (*R. discerptus* P. J. Muell.)!

Most constant and easily recognised. Distinguished from *R. radula* by furrowed hairy st., rather unequal prk., deeply incised lts. and narrow cylindrical leafy pan.; and from *R. rufa* by dense hairs on st. and rach., thicker more deeply incised lts., narrow less-branched pan., stouter ped., larger fl., etc. The '*R. rufa*, var. *microphyllus* Blox.', is clearly only a small state of *R. echinatus*. *R. Genevierii* Bor. (not yet ascertained to be British) is a nearly allied form, with a closer mat of very short hairs on st. and a much broader elongate pyramidal pan. with rigid patent or divaricate branches.

63. *R. rufa* Wh. & N. in *Bluff and Fing. Comp. Fl. Germ.* i. 683 (1825); not of Babington formerly nor of Holuby. St. arcuate-prostrate or climbing, furrowed above, usually quite glabrous, rough with very short unequal stkd. gl. and acic., dark purple. Prk. many, short, fairly stout, declining. L. large, 3-5-nate-pedate. Lts. irregularly coarsely serrate, dark green wrinkled subglabrous above when young ashy or whitish-felted beneath, afterwards green, thinly hairy, or rarely somewhat felted; term. roundish-ovate or oval (rarely rhomboidal) with long acuminate point, entire base, and stalk less than $\frac{1}{3}$ its length; lat. in 3-nate l. gibbous or deeply lobed. Pan. broad, with crowded, often interlacing, many-flowered branches; rach. and long slender ped. grey-felted, with short hairs and very crowded sessile and subsessile gl. and short acic. and a few rather weak declining prk.; lts. large, often cuneate-based. Fl. rather small. Pet. pink. Stam. somewhat exceeding sty. Carp. glabrous.

Set, No. 16. Woods and thickets. From Somerset and Sussex to Derbyshire, fairly frequent. Not yet found in Wales or Scotland.

V.C. in England 14 [1]. Irish Co. 2. Guernsey!

Germany! Brittany!

A very distinct and easily recognised species: the crowded sessile and subsessile gl. on st. and rach. and the diffuse pan. with very numerous slender-pedicelled small pink fl. being especially noticeable, marking it off at once from its near ally *R. echinatus*.

b. L. normally green and rather thinly hairy beneath (sometimes thinly felted in vars. *Newbouldii* and *Bloxamianus*).

64. *R. oigocladus* Muell. & Lefv.? In *Pollich.* xvi.-xvii. 134 (1859). *R. fusco-ater* Bab. (in part). *Journ. Bot.* 1895, 82. St. bluntly angled, dark purple, glaucous; usually with short partly appressed hair; the faces deeply striate, with rather crowded, subequal, short acic. tubercles and stkd. gl. Prk. subequal, nearly confined to angles, chiefly declining from short base, fairly long. L. 5-nate-pedate and 3-nate. Lts. subcoriaceous, strigose above, pale green and thinly hairy beneath, with shallow sharply pointed teeth, nearly simple at sides, often more deeply incised and somewhat compound at end; term. obovate-cuspidate, rather long and usually narrowed considerably to the emarginate base, with short point and moderate stalk. Pan. narrow, with very lax, nearly erect racemose-corymbose branches below and a rather dense subracemose-corymbose ultra-axillary top; rach. and ped. with whitish felt and dense

short hair nearly hiding most of the crowded dark subsessile glands; prk. slender, declining, usually few. Sep. strongly reflexed on fall of pet. and usually in frt. Pet. white. Stam. exceeding sty. Frt. somewhat elongate. Young carp. fairly hairy.

Set, No. 92. Woods and thickets. From Devon and N. Hants to Lincoln; apparently rather local, but abundant in parts of Devon and Herefordshire.

V.C. in England 12 [3]. Irish Co. 1 [3].

France!

Name suggested as probably right by Dr. Focke. Our plant seems rather stronger than a French specimen of Lefevre's collecting in Mr. K. Friderichsen's hb. (seen by me, Nov. 1895), while otherwise very similar. The ordinary Devon form (see *Fl. Plym.* p. 124, '*R. fusco-ater*') is identical with that of Herefordshire; but in the former county nearly allied forms occur with longer hair on st. and rach., and others with more compound pan. Not unfrequently the term. lt. is as nearly truncate at the end as in *R. mucronatus*, but it seems always longer and more narrowed below than in that species, from which *R. oigocladus* may also be readily distinguished by the radulan armature and more reflexed sep.

Var. *Newbouldii* (Bab.)? in *Journ. Bot.* 1886, 230, and 1887, 20. *R. radula* Weihe, var. *denticulatus* Bab. *Man.* ed. 5, 105 (1862). *St. sharply angled and furrowed, far more thickly clothed with subequal prk. (on angles) and various short glandtipped organs and patent hairs, usually non-pruinose. Lts. with rather more deeply and finely pointed double teeth, softly hairy or more rarely greyish-felted beneath, with more prickly stalks and midribs; term. shorter, roundish-obovate, with rather longer and more acuminate point and subcordate base. Pan. normally compound, though in poor soil often racemose above; rach. with longer hairs and stkd. gl. rather more unequal, though still almost wholly sunken. Sty. red.*

Set, No. 66. Thickets and woods, especially in sandy soil. Distribution uncertain, owing to the ill-defined character of the var.; but the form represented in the Set is fairly frequent in N. England, and I have seen specimens of the same or a nearly allied form from 3 Irish counties.

V.C. in England 10 [3]. Irish Co. 3. Endemic?

Since the issue of the Set No. 66, I have examined the *R. Newbouldii* packet in the Cambr. hb., and must own to considerable doubt as to the identity of Major Wolley-Dod's Edge Green plant with the authentic Loxley specimens collected by Rev. W. W. Newbould, on which Prof. Babington founded his new species. I expect that this Loxley plant will prove to be *R. Drejeri*. Another sheet in the Cambr. packet contains pieces of a Peat Moor (Somerset) form collected by Mr. H. S. Thompson and also named *R. Newbouldii* by the Professor, but looking hardly identical with the Loxley plant. Mr. Thompson's specimen however is too imperfect for satisfactory determination. If Mr. Newbould's plant is found to be *R. Drejeri*, I would suggest the transference of the name *R. Newbouldii* to the Edge Green plant as described above and as found in other counties. It goes off from *R. oigocladus* towards *R. fuscus*. *R. Drejeri* was published in 1883, and *R. Newbouldii* in 1886.

Var. *Bloxamianus* Colem. ex Purchas (as var. of *R. radula*) in *Journ. Bot.* 1887, 102. Cf. *B. E. C. Rep.* 1889, 255. *St. strong, angular, reddish or pale fuscous, subpruinose, glabrous or subglabrous, with dense very short subequal bristles and stkd. gl. Prk. moderate, subequal, with long base, almost or quite confined to the angles, patent or declining. Lts. glabrous above, green and slightly hairy, or more rarely (when young) with thin grey felt, beneath; term. roundish-obovate (as in var. *Newbouldii*), but with shallow teeth and rather short point (as in *R. oigocladus*),*

and emarginate or entire base. *Pan.* rather short, less interrupted above, with narrow rounded top, densely glandular and bristly rach. and ped. and subpatent frt.-sep.

Set. No. 93. 'Not uncommon on the borders of Derbyshire and Leicestershire.' Common in the Anker Valley, Warwickshire. Middlesex. Allied form in N. Devon and S. Somerset.

V.C. in England 6. Endemic?

Clearly a radulan form, and nearly intermediate between *R. radula* and the Sub-Bellardian *R. scaber*;—in general look being more like the latter, though in armature thoroughly eu-radulan. The extraordinarily dense short subequal glandular and bristly clothing of st. and pan.-rach. seems equalled only in our *leptopetalus* var. nov. described below under *R. pallidus* Wh. & N.

65. *R. regillus* A. Ley in *Journ. Bot.* 1896, 217. *R. debilis* Bab. (in part). *R. cognatus* N. E. Br. (in part). St. low-arching, bluntly angled, hairy, glaucous, pale greenish-brown, very leafy, with a good many short unequal bristles and stkd. gl. rarely exceeding the hair. Prk. rather unequal, nearly confined to the angles, declining from rather broad much compressed base. L. mostly 3-4-nate, a few 5-nate. Lts. large, thin, green and slightly hairy on both sides, with uneven and mostly shallow teeth; term. nearly oblong, truncate above, with long cuspidate point, cordate or subcordate base and rather short stalk. Pan. long, lax, narrow, with several simple l. almost reaching the top, subracemose above, with short branches of 2-4 long-pedicelled fl. below; rach. and ped. with close felt and patent hairs hiding most of the numerous stkd. gl. and bristles; prk. very slender, declining or patent. Sep. reflexed in fl. and frt. Pet. white. Stam. exceeding sty. Whole plant of a yellowish-green tint.

Not in Set. Woods and hedges. Locally abundant over an area of at least three square miles in Herefordshire and W. Gloucestershire. Gilhall Demesne, Co. Down (apparently the same). Endemic?

Evidently radulan, and near aggregate *R. oigocladus*, though seeming quite distinct from the three segregates described above;—going off from them towards *R. podophyllum*. From this it may be distinguished by its pale yellowish-green colour, larger lts. with longer more cuspidate point and all the teeth directed forwards, long dense patent hairs on rach., strongly reflexed sep., and, generally, the more distinctly radulan armature, with no acic. conspicuously intermediate between the subequal prk. and very short stkd. gl.

SECT. II. Stkd. gl. and numerous acic. on pan.-rach. and ped., though rarely long, usually far exceeding the close felt or very short hairs. Stkd. gl. and acic. on st. more thinly and unequally scattered, sometimes nearly absent.

66. *R. podophyllum* P. J. Muell. in *Bonpl.* 1861, 281, and in *Boul. Ronces Vosg.* N. p. 61, sp. 44 (1867). *Journ. Bot.* 1887, 23; not of Kuntze. St. nearly prostrate, bluntly angled, usually subglabrous, rarely more hairy, dark purple or reddish, with short unequal stkd. gl., acic. and pricklets in varying quantity. Prk. unequally scattered; those on angles nearly equal, mostly declining; some on faces shorter and more unequal. L. 3-5-nate. Lts. convex, green and thinly strigose on both sides, rarely with some felt beneath, finely but irregularly serrate, with a few teeth patent; term. oval-oblong or obovate-oblong, cuspidate-acuminate, with rather short point and subcordate base; lat. similar. Pan. narrow, subpyramidal, often racemose or subracemose above, with some simple l. under the short ultra-axillary top; rach. with close grey felt, sometimes also thinly hairy; prk. chiefly acicular, declining; acic. and stkd. gl. variable

in number, usually *weak and unequal*. Frt.-sep. patent, then loosely reflexed, with rather close cushion of greyish felt, somewhat glandular and aciculate. Pet. white or greenish-white. Stam. not greatly exceeding sty. Carp. glabrous. General colouring rather dingy.

Set. No. 91. Bushy places in slate quarries, etc. Apparently very local, except in some northern counties.

V.C. in England and Wales 14 [2].

E. France!

An obscure species, on the whole most at home among the *Radulæ*, though some of the plants now put under it make an approach towards *R. mucronatus* and *R. melanoxyton*. The stronger forms, which are frequent in some parts of N. England, also recall *R. ericetorum*, but seem to differ from it constantly in the denser pan.-top with subpatent sep., white pet. and rather short stam., and the greener more shortly pointed oblong lts., as well as in the more radulan armature. The remarkable range of variation in armature however is a fruitful source of difficulty in this sp., and some of the less glandular forms might almost be mistaken for shade-grown thin-leaved *R. pyramidalis*.

(*R. adenanthus* Boul. & Gill.) See Group VIII., *Egregii*, p. 53.

(*R. infecundus* Rogers.) See Group XII., *Koehleriani* (under *R. rosaceus*), p. 80.

(*R. fuscus* Wh. & N.) See Group XI., *Sub-Bellardiani*, p. 73.

GROUP X. SUB-KOELHLERIANI. See pp. 5, 15.

For conspectus of the plants in this group see p. 15.

67. ***R. Griffithianus*** Rogers ex Griffith in *Fl. Angl. & Carn.* p. 48 (1895). St. bluntly angled, striate or subsulcate, glaucous, with appressed and patent hairs (usually crowded) and numerous scattered unequal prklets acic. and stkd. gl. Large prk. conspicuously unequal, deep red, broad based, mostly straight and nearly confined to the angles, a few with very long points. L. mostly 5-nate-pedate. Lts. strigose above, white or ashy-felted beneath, usually with fine teeth compound and incised in the upper half of the lt. ; term. with rather long acuminate point and stalk about $\frac{1}{3}$ its length, obovate with emarginate base, or rarely roundish-ovate subcordate. Pan. rather narrow, with short distant racemose branches below, and a moderately long ultra-axillary part with nearly patent few-flowered branches, slightly narrowed top, and usually one or more simple or 3-fid l. : rach. and ped. grey or greenish-grey felted with thinly placed patent hairs exceeding most of the unequal stkd. gl. ; prk. like those on st. but slenderer, patent and declining ; upper l. conspicuously white or ashy-felted beneath. Fl. showy. Sep. with very pale velvety felt sunken glands and a few acic., strongly reflexed at first, subpatent later. Pet. pinkish. Stam. exceeding sty. Young carp. pubescent.

Not in Set. Chiefly in hilly places. Locally abundant in N. Devon and N.-W. Carnarvonshire. S.-W. Anglesey.

V.C. in England and Wales 3 [4]. Irish Co. [2]. Endemic?

The combination of strong very unequal bright red prk. on st. and pan.-rach. with the whitish felt on rach., sep. and under-surface of l., makes recognition of the typical plant comparatively easy ; and it will probably be discovered elsewhere in the West. Closely allied forms, hardly admitting of specific distinction, occur in N. Devon, W. Kent, on the borders of Worcestershire and Herefordshire, and in Co. Westmeath and Galway. The Devon plant especially (abundant in the Lynton neighbour-

hood) can hardly be said to differ from the Welsh type except in the less deeply cut leaf-toothing.

Near *R. Griffithianus*, and yet apparently distinct from it, is the local Dorset plant formerly named *R. praeeruptorum* Boul. by Prof. Babington, described by me under that name in *Journ. Bot.* 1892, 301, and issued in the Set, No. 15. As I have seen no authentic specimens of Boulay's plant and find what seem to me several distinct species put together under this name in the Cambr. hb., I have thought it best to omit all description of *R. praeeruptorum* from this handbook. Cf. *Journ. Bot.* 1878, 142, 143; 1895, 100.

68. *R. melanodermis* Focke in *Journ. Bot.* 1890, 133. *R. melanoxyton* Bab. (*Journ. Bot.* 1887, 21); not of Mueller and Wirtgen. *St.* prostrate, bluntly angled, *subglabrous*, blackish-purple, glaucous, striate, with many subequal prklets acic. and stkd. gl. and *a few intermediate prk.* on the faces. *Large prk.* on angles *strong*, rather unequal, mostly declining or subfalcate. *L.* 3-5-nate-pedate. *Lts.* plicate, concolorous, very rarely imbricate, with somewhat compound incised teeth in the upper half, dark green and strigose above, paler and *thinly hairy* beneath; *term.* obovate-truncate, rarely oval, with *rather long cuspidate* or *cuspidate-acuminate point* and cordate or subcordate base, about $3\frac{1}{2}$ times the length of its stalk. *Pan.* remarkably narrow, ultimately lax, with *short strongly ascending racemose lower branches* and (usually) moderate ultra-axillary part, sometimes with simple l. to the top; *uppermost branches* very short, 2-3-flowered; rach. and ped. villous-felted, with crowded sunken gl. (mostly very short) and a few weak declining prk. *Sep.* ovate-attenuate, often glandular, rarely aciculate, *reflexed in fl.* and frt. *Pet.* pinkish or white. *Stam.* slightly exceeding the pink-based sty. *Young carp.* hairy.

Set, No. 17. Heaths and bushy places. Locally abundant from Mid-Dorset to the southern border of New Forest, Hants. Buckstane. W. Gloucestershire. Egg Buckland, S. Devon?

V.C. in England 3 [1]. Endemic?

The extraordinary blackish-purple tint, extending from st. to prk. petiole petiolules and occasionally even to midrib and margin of the young l., both justifies Dr. Focke's name for this species and accounts for Prof. Babington's confusing it with *R. melanoxyton*, which however is much less glandular and considerably different in l. and pan. (see p. 59). Young plants of *R. Bloxamii* may more easily be mistaken for *R. melanodermis*, though usually to be distinguished at once by the paler much more hairy st., shorter prk. and more lobate lts. with softly hairy under-surface. When the pan. is fully developed all close resemblance between the two sp. disappears, that of *R. Bloxamii* being broadly pyramidal with rounded top, cal. subpatent and starlike on fall of pet., and carp. exceedingly small.

69. *R. Babingtonii* Bell Salt. in *Ann. Nat. Hist.* xv. 307 (1845). *Journ. Bot.* 1886, 228. *R. scaber* Bab. *Rub.* (in part). *St.* arcuate-prostrate, bluntly angled, subsulcate above, fuscous, with many *patent clustered and single hairs*; intermediate prk. and prklets. fairly many; acic. and stkd. gl. usually fewer but variable. *Large prk.* many, subequal, nearly confined to the angles, *moderately strong*, stout-based, with *slender yellowish point*, chiefly declining. *L.* 3-5-nate. *Lts.* thick opaque and slightly strigose above, pale green *softly hairy* or somewhat felted beneath, with compound finely pointed teeth in the upper half; *term.* rather broad, oblong-oval or slightly obovate, with *fairly long cuspidate-acuminate point*, subcordate base, and stalk $\frac{1}{3}$ its length. *Pan.* usually very large elongate broadly cylindrical-truncate, the greater part ultra-

axillary but furnished with 2 or 3 simple l. passing into subfoliaceous bracts; *nearly all the branches of equal length, patent or divaricate, subumbellate; rach. and ped. densely villous-felted*, with many declining acicular prk. unequal sunken glands and minute acic. *Sep. clothed externally with long yellowish-grey hair, aciculate, glandular, rising as the frt. forms, subpatent or loosely reflexed later. Pet. faintly pinkish. Stam. only slightly exceeding sty.* Young carp. considerably hairy.

Set, No. 94 (and 42 in part). Commons and bushy places. Widely distributed in S. England, and extending northwards to Derbyshire and Cheshire.

V.C. in G. Britain 23 [2]. Co. Galway! (a form).

Normandy! (a form).

Marked features which in combination separate this sp. from its allies are the villous hair on st. and rach. hiding most of the stkd. gl., the thick broad soft lts. and the long cylindrical-truncate pan. with patent branches, comparatively short stam. and villous rising sep. The Danish and Schleswig *R. flensborgensis* Frider. is very similar in l. and pan., but much less *Sub-Koehlerian* in armature.

Var. *phyllothyrsus* (Frider.) in *Rub. Gallic. exs.* (as distinct sp.) N. 81 (1896). *R. Babingtonii*, *forma umbrosa*, Set, No. 94. *B. E. C. Rep.* 1897, 545. Differs from type by lts. thin, only slightly hairy beneath and so somewhat harsh to the touch, with simpler less incised teeth; term. lt. obovate-acuminate; pan. with many (often 6-12) ovate-acuminate simple l. above, stronger falcate prk., more loosely reflexed sep., rather longer stam. and glabrous carp.

Set, No. 94 (2nd sheet, 'f. *umbrosa*'). Woods and bushy places. Thinly spread from Radnorshire across Mid. England. Derbyshire (one locality).

V.C. in England and Wales 7.

N.-W. Germany!

70. **R. Lejeunei** Wh. & N. in *Bluff and Fing. Comp. Fl. Germ.* i. 683 (1825); not of Wirtgen or early British authors. St. rather bluntly angled and hairy (subglabrescent in shade), dull brown or fuscous, with few or fairly many very unequally scattered stkd. gl. short acic. and prklets. *Prk. on the angles slender, moderate or rather small, mostly declining. L. chiefly 3-4-nate; a few 5-nate-pedate. Lts. light green, strigose above, hairy beneath, with rather shallow nearly simple teeth; term. obovate-rhomoidal with fairly long acuminate or more rarely cuspidate-acuminate point, narrow entire base, and stalk about $\frac{1}{3}$ its length. Pan. lax, loosely pyramidal; the greater part ultra-axillary, with an occasional simple ovate l.; the lower branches long racemose, the upper chiefly 1-2-flowered; rach. and ped. with pale grey felt loose hairs scattered unequal stkd. gl. and a few glandtipped bristles; prk. very slender, patent or declining. Sep. long-pointed, reflexed with rather close greenish-grey felt and many protruding stkd. gl. and acic. Pet. broad, bright pink. Stam. pink, far exceeding sty. Young carp. pubescent.*

Not in Set. As yet found only in Breconshire woods at Llanwrtyd and near Builth.

Germany (very rare). Belgium. France! Spain. N. Italy.

Dr. Focke writes (in litt. Dec. 1897) on Mr. Ley's Llanwrtyd spn.: 'I can name this without any doubt *R. Lejeunei*. It is evidently quite the same form as the original type of Weihe's gathered near the frontier between Germany and Belgium.' He now places it among the true *Koehlerian*, which he could hardly do if the continental plant were not more strongly armed than our Brecon one. This, which seems a rather weak woodland form, hardly recalls any of those to which the name was formerly applied

in Britain. The armature especially is weak for this group, and yet so far unequal as to be fairly Sub-Koehlerian.

Var. *ericetorum* (Lefv.) in *Bull. Soc. Bot. Fr.* xxiv. 223 (1877). Near *R. Lejeunei*, but more strongly armed and more glandular; with st. strong sharply angled and having stouter and longer prk. on the angles; l. more frequently 5-nate; lts. with longer acuminate point, greyish felt beneath and more incised teeth; pan. of great length with corymbose top, rach. and ped. densely glandular and aciculate with crowded declining prk. and strong acic.; sep. with soft cushion of grey felt hiding most of the purplish gl., sometimes aciculate; pet. narrow, pinkish or white.

Set. No. 95. Commons, thickets and woods. Locally abundant in S. England and over the Welsh border.

V.C. in England and Wales 13 [3]. Guernsey!

France.

The prevailing form of *R. Lejeunei* in England, and usually recognisable without difficulty. Often as strong as *R. Babingtonii*, but when fully developed easily distinguished from it by the more unequal armature, thinner obovate grey-felted lts. and pyramidal lax pan. with reflexed close-felted frt.-sep. long stam. and short loose hair on rach. and ped.

71. *R. cavatifolius* P. J. Muell. ex Babington in *Journ. Bot.* 1878, 144. *R. Koehlerii* Wh. & N., var. *cavatifolius* Bab. Cf. *Journ. Bot.* 1886, 231, and *B. E. C. Rep.* 1885, 126. St. subglabrous, pale reddish-brown, with scattered short prklets, acic. and stkd. gl. Prk. on the angles fairly strong, mostly declining, rarely somewhat falcate. Intermediate prk. usually few or none. L. 5-nate, often very large. Lts. thin, yellowish-green, doubly acutely dentate-serrate, subglabrous or thinly strigose above, when young much paler and softly hairy beneath, greener and only thinly hairy later; term. very broadly cordate-ovate, with remarkably long attenuate point and stalk from $\frac{1}{2}$ to $\frac{1}{3}$ its length; interm. and bas. very similar but narrower. Pan. long, nearly cylindrical with slightly narrowed truncate top; all the branches conspicuously patent or divaricate, the lower very distant subracemose, the upper rather crowded few-flowered subumbellate, with many narrow simple l.; rach. and ped. with rather short patent hair crowded subsessile and sunken stkd. gl. short acic. and rather weak declining prk. Sep. reflexed, greenish, with narrow white margin. Pet. rather small, obovate. Stam. (ultimately pink) about equalling the sty. Carp. glabrous, or nearly so.

Set. No. 68. Bushy places. Abundant in the Monmouthshire district bordering on the Wye Valley and reaching a few localities in Herefordshire and W. Gloucestershire. Reported from six other English counties and one Scottish.

France.

This rests on the authority of Prof. Babington, who (in the 1885 *B. E. C. Rep.* and the 1886 *Journ. Bot.*) says that the English plant agrees well with Abbé Boulay's description and spns. I have seen no authentic continental spns. The plant of Monm. Heref. and W. Glos. is very distinct and constant, and may be recognised without difficulty by its pale yellowish cordate-ovate term. lt. with extraordinarily long point and the singularly divaricate branches which are rarely wanting in the fully developed pan. Confirmation of its occurrence in other counties is desirable. The Bishopstoke plant thus named by the Professor for Mr. J. Groves is surely considerably different, going better with *R. mutabilis*.

72. *R. mutabilis* Genev. in *Mém. Soc. Acad. M. & L.* viii. 84 (1860). *R. monachus* G. Jensen? St. nearly prostrate, considerably hairy, somewhat glaucous, with unequal stout-based prklets and acic. and (usually) very few stkd. gl. Large prk. many, unequal, chiefly on the

angles, often somewhat falcate. L. chiefly 5-nate. Lts. all exceptionally long, rather thick, deeply incised with compound acute teeth, strigose above, with close whitish or grey felt beneath; term. oval, narrowed at both ends, with very long gradually acuminate point, nearly (or quite) entire base, and stalk $\frac{1}{3}$ its length. Pan. strongly developed, nearly cylindrical, usually broad and in great part ultra-axillary, with truncate top and one or more narrow attenuate simple l.; nearly all the branches patent with compound many-flowered cymes; rach. and ped. grey-felted and hairy, with crowded sunken stkd. gl. and acic. and many long prk. (nearly patent in the upper part, declining or falcate below). Sep. reflexed, often long-pointed aciculate and glandular. Pet. very long, narrow, white or whitish. Stam. white, far exceeding pale sty. Frt. rather small. Young carp. hairy.

Set. No. 44. Bushy places. Too imperfectly known for any satisfactory account of distribution.

V.C. (for aggregate, excl. var. *nemorosus*) in England and Wales 5 [5]. France.

The name of this sp. seems only too well justified. The above description, made from Surrey and Sussex spns., is that of a well-marked bramble intermediate between *R. echinatus* and *R. pallidus* Wh. & N. Other spns. from the counties of Somerset, Hants, Brecon and Glamorgan seem rather nearly allied than identical. The Yorkshire plant thus named by Genevier I have not seen, but Prof. Babington stated that it 'seems to agree well' with the Surrey spns.

Subsp. *nemorosus* Genev. ex Babington in *Journ. Bot.* 1886, 232; not of Boenninghausen, Guenther or Hayne. '*R. mutabilis* Genev.' of Briggs' *Fl. Plym.* *R. obliquus* Blox. (not of Wirtgen). St. less conspicuously hairy, sometimes subglabrescent. Large prk. with broader base, more frequently patent. Lts. much wrinkled above, with subvelvety felt beneath; term. cordate-ovate-acuminate. Pan. long, pyramidal, very lax below, interrupted and more leafy above, with all the branches ascending; rach. and ped. felted but scarcely hairy, with more numerous and more prominent stout-based acic. Sep. often patent on fall of pet., ultimately reflexed. Pet. rather greenish-white. Stam. only slightly exceeding sty. Frt. large, oblong, 'well flavoured and abundantly produced.'

Set. No. 69. Hedges and open waste places. Very abundant in several districts around Plymouth, S. Devon. Endemic?

A very distinct and constant form.

73. **R. Bloxamii** Lees in Steele, 55 (1847). *R. splendidus* P. J. Muell. *R. multifidus* Boul. St. soon prostrate, bluntly angled, glaucous, hairy (usually densely), purplish-red; unequal prklets. acic. and stkd. gl. crowded. Larger prk. (chiefly on angles) rather weak, declining or somewhat falcate. L. mostly 5-nate-pedate. Lts. convex, very rarely imbricate, opaque, wrinkled and very strigose above, paler and softly hairy beneath, wavy at edge, with very compound lobate-incised teeth in the upper half; term. broadly obovate, with fairly long cuspidate-acuminate point (usually curved), entire or emarginate base, and stalk less than $\frac{1}{3}$ its length; interm. very similar but rather narrower and gibbous on lower side. Pan. leafy almost or quite to the rounded top, with crowded and often interlacing patent-erect branches above and distant strongly ascending rigid branches below (often very long and like secondary pan.); rach. and ped. straight stout densely villous-felted aciculate and glandular, with most of the small acic. and purple stkd. gl. sunken; the many very slender prk. chiefly declining, a few patent and falcate. Sep. clothed like ped., white-margined, conspicuously white-felted within, patent and starlike when the pet. fall, loosely reflexed in frt. Pet. white or faintly pinkish,

variable in size, fugacious. Stam. unequal, in part often falling short of sty. *Carp. exceptionally small*, often considerably hairy.

Set, No. 20. Heaths, bushy places, etc., in S. and Mid. England. Widespread and locally most abundant.

V.C. in England and Wales 21 [3]. Irish Co. 1 [1]. Guernsey! (abundant). France!

A hairy shaggy-looking plant, remarkably constant in character except in the size of the pet. The incised lts., round-topped pan. with long rigid lower branches and patent starlike cal. (on fall of pet.) are conspicuous features preserved in plants which Dr. Focke has raised in his garden at Bremen from frt. gathered in Dorset. Good French spns. of *R. multifidus* Boul. (1889),—for which I am indebted to Mr. Friderichsen,—collected in the Forest of Moulineux, seem quite indistinguishable from *R. Bloxamii*, as Prof. Babington held *R. splendidus* P. J. Muell. to be. *R. thyrsiflorus* Wh. & N. appears to be really different, though rather nearly allied.

(*R. anglosaxonicus* Gelert and its subsp.) See Group VIII., *Egregii*, p. 57.

(*R. rosaceus* Wh. & N., with its vars. and subsp.) See Group XII., *Koehleriani*, p. 78.

GROUP XI. SUB-BELLARDIANI. See pp. 5, 16.

SECT. I. Hairs on st. and pan.-rach. dense and fairly long, usually patent. L. mostly 5-nate.

a. Sep. normally reflexed, though often partially patent (or even erect) in frt.

74. *R. fuscus* Wh. & N. in *Bluff & Fing. Comp. Fl. Germ.* i. 681 (1825). *R. Buhnenensis* G. Br.? St. angular and sometimes furrowed above, roundish below, *densely hairy*, with a good many short sunken acic. stkd. gl. and small prklets or tubercles, pale dull brown or fuscous, sometimes glaucous. Prk. rather short, subequal, declining, not wholly confined to the angles. L. mostly 5-nate-pedate. Lts. with compound irregular teeth, strigose above, paler and hairy (in sunny places very soft) beneath; term. broadly ovate or obovate, with long acuminate point, entire or subcordate base, and stalk more than $\frac{1}{3}$ its length. Pan. moderately long, *nearly cylindrical*, with patent or patent-erect subequal, few-flowered branches; rach. and ped. with dense patent hairs, sunken stkd. gl. and acic. and prk. usually slender and declining, though in sunny places often stout and falcate. Frt.-sep. reflexed. Pet. white or pinkish. Stam. exceeding sty.

Set, No. 18 (in a very aggregate sense only, as the S. Hants spns. so numbered belong to var. *nutans*, and the Bull's Hill, Walford, ones to the form described below under *R. pallidus* as var. *leptopetalus*). Woods and open places. Apparently only thinly distributed from S. England to Yorkshire, and seldom quite typical with us.

V.C. in England and Wales 21 [2]. Irish Co. 1 [2]. Germany. Belgium. France.

Variable. In some of its forms apparently nearer than any other in the group to the true *Radula*. When very strongly armed it recalls the *Sub-Koehleriani*, but the average state of it seems *Sub-Bellardian*. A fuller study of all the forms may perhaps result in the formation of a large sp. collect. embracing all or nearly all the plants here included under

R. fuscus and *R. pallidus*; but there are difficulties in the way of such an arrangement.

Var. *nutans* Rogers in *Journ. Bot.* 1892, 304 (cf. the 1890 vol. p. 133). St. slender, very long, trailing, dull green. Prk. more unequal. Hairs rather shorter. Lts. more incised and with very attenuate point; dull dark green above, scarcely paler beneath. Pan. very lax, often exceedingly long narrowed above, usually drooping, with many long narrow simple l. often reaching the top; most of the upper branches only 1-2-flowered. Frt.-sep. more frequently erect at first. Sty. red.

Set. No. 18 (in part :—viz. all S. Hants spns.). Chiefly in wood borders and neighbouring hedges. Very common along the southern border of the New Forest, and apparently rather frequent in some of the Home counties and the Midlands.

V.C. in England 7 [2]. Endemic?

A remarkable var. making some advance towards *R. pallidus* Wh. & N.

Var. *macrostachys* (P. J. Muell.) in *Flora* xli. 150 (1858). Prk. longer. Lts. whitish-felted beneath. Pan. pyramidal, with conspicuously patent or divaricate branches and densely villous blackish-purple rach. ped. and st. Stam. shorter. Young carp. pubescent.

Set. No. 126. Woods. In Denbigh and several counties across Mid. England from Hereford and Chester to Derby and Essex. Also in Co. Dublin and Westmeath.

V.C. in England and Wales 6 [1]. Irish Co. 2.

Germany.

A handsome form near the type but somewhat intermediate between it and *R. radula*. Not always distinguished without difficulty from *R. Newbouldii*.

b. Frt.-sep. mostly erect.

Subsp. *obscurus* (Kalt.) *Fl. Aach. Beck.* 281 (1845). Not of P. J. Mueller nor of British authors up to 1895. See *Journ. Bot.* 1895, 101, and 1896, 219. Chief prk. very strongly declining or somewhat hooked; the rest of the armature usually abundant but small and sunken, consisting of minute acic. and prklets, with scattered subsessile and short stkd. gl. Lts. with even crenate-mucronate teeth, sometimes grey-felted when young. Pan. long, lax, well developed, with many simple l. above. Frt.-sep. mostly erect. Pet. deep red. Stam. and sty. subequal, red. Frt. handsome, very acid. Young carp. hairy.

Set. No. 125. Woods. Apparently rare. One N. Wilts locality. Belmont Wood, Hereford abundant. Co. Wexford.

Germany.

Rightly placed here because of the very considerable though minute glandular development. Otherwise just intermediate between *R. fuscus* and *R. hirtifolius*. Distinguished from var. *macrostachys* by the strongly declining prk., greener lts. with even teeth, clasping frt.-sep., deep red pet. and paler colour of st. Forms of *R. fuscus* occurring at Redbrook (W. Gloucester) and W. Malvern (Herefordshire) so strongly recall *R. obscurus* as to make specific distinction hardly possible.

SECT. II. Hairs on st. abundant, rather short, loose or partly appressed.

L. 5-nate or 3-4-nate. Sep. erect or patent on unripe frt., often reflexed ultimately.

a. L. mostly 5-nate.

75. *R. pallidus* Wh. & N. in *Bluff & Fing. Comp. Fl. Germ.* i. 682 (1825); not of Babington up to 1886, nor of Holuby. *R. humifusus* Bab. *R. obliquus* Wirtg. St. arcuate-prostrate, roundish below, with much rather short only partially patent hair, many weak acic. and short

unequal stkd. gl. Prk. subequal, slender, strongly declining, with long base, usually confined to angles and very pale. L. 3-5-nate-pedate, in luxuriant plants mostly 5-nate. Its. thin, pale green, normally strigose above and thinly hairy beneath, but not unfrequently subglabrescent on both sides, *very coarsely and irregularly toothed*; term. narrowly ovate or somewhat obovate, with *very attenuate-acuminate point*, narrow cordate base, and stalk about $\frac{1}{3}$ its length. Pan. lax, rather straggling, usually subpyramidal, though *with fairly broad top*; lower branches erect-patent racemose, topmost 1-2-flowered, intermediate cymose-umbellate: *upper l. simple, narrowly ovate-acuminate or linear; wavy rach. and slender ped.* felted with short patent hair hiding most of the blackish stkd. gl. and minute acic.; prk. declining, chiefly acicular. Sep. long, narrow, erect on unripe frt., loosely reflexed at last. Pet. oval, white or pinkish. Stam. exceeding red sty. Carp. glabrous.

Set. No. 67. Chiefly in hilly woods and on marly soil. Rather thinly distributed through England and in three of the border Welsh counties. Apparently quite local in the south.

V.C. in England and Wales 24 [2].

Denmark. W. Germany! N. France.

Near *R. fuscus*, but with slenderer and usually altogether weaker armature, shorter hair on st. and pan.-rach., thinner longer-pointed more macrophyllus-like lts. and a more straggling more nearly pyramidal pan. with sep. conspicuously erect on the unripe frt. From shade-grown forms of *R. viridis* it differs by the absence of intermediate armature, more compound pan. with wavy rach. and frt.-sep. ultimately reflexed.

leptopetalus var. nov. St. very leafy, angular, somewhat glaucous, *most densely clothed with short acic., subsessile and short stkd. gl.* L. 5-nate-pedate. Its. much as in *R. pallidus* but of a bluish or glaucous green and *with sharply pointed incised teeth*; term. more constantly obovate and usually somewhat lobate above. Pan. usually broad and rather short, *with slender interlacing branches*. Pet. small, very narrow greenish-white.

Set. No. 18 ('*R. fuscus*', in part, viz. all spns. from Bull's Hill and Linton Wood, Herefordshire). Wood borders and bushy banks. Widely distributed and locally abundant in at least 8 S. and Mid. England counties.

Schleswig!

A constant well-marked form formerly thought by Dr. Focke to be *R. Loehri* Wirtg. (see *Journ. Bot.* 1896, 219, 276). It is identical with a Schleswig plant for which Mr. Friderichsen has suggested the name '*R. pallidus* Wh. & N. subsp. *Loehri* (Wirtg.) var. *leptopetalus*'. The alliance with *R. pallidus* however is so close that it seems best to omit all reference to *R. Loehri*, especially as Dr. Focke now considers Wirtgen's plant to be only a weak form of *R. fuscus*. Mr. Friderichsen, has, I believe, published no description. In glandular development and broad pan. with slender interlacing branches it diverges from both *R. pallidus* and *R. fuscus* towards *R. rudis*.

b. L. 3-4-nate, rarely 5-nate.

76. *R. scaber* Wh. & N. in *Bluff & Fing. Comp. Fl. Germ.* i. 683 (1825); not of early British authors, nor of Kaltenbach, Wirtgen, etc. St. soon prostrate roundish glaucous pubescent, rough with *short stkd. gl.* minute acic. and *scale-like tubercles*. Prk. small, stout-based, subequal, declining. L. 3-5-nate-pedate. Its. subcoriaceous, with *fine teeth*, *wrinkled* and *strigose above*, paler and thinly hairy with prominent ribs beneath, rarely somewhat felted when young; term. ovate-obovate or roundish-oval, with rather short acuminate point (longer in shade), subcordate base, and stalk about $\frac{1}{3}$ its length. Pan. well developed, usually

rather narrow, with ascending racemose branches below and short few-flowered ones above; *rach.* and *ped.* felted with short hair dense *subsessile* and short *stkd. gl.* and scattered acicular *prk.* Very rarely a few longer *stkd. gl.* occur and some unequal *acic.* *Fl.* usually small. *Sep.* greyish-green, white-margined, aciculate and glandular, in *frt.* usually patent or erect for a time, though reflexed later. *Pet.* narrow, white or greenish-white. *Stam.* usually exceeding *sty.* Young carp. puberulous or hairy.

Set, No. 124. Bushy places and damp hollows. Rather thinly distributed from S. Devon and Kent to Derbyshire and Breconshire.

V.C. in England and Wales 21 [11]. Irish Co. 5 [2].

Germany (rare)! France (Vosges).

Very Bellardian in habit, but on the whole (in spite of the smallness of the *prk.*) nearer to the *Radulae* in armature and character of glandular development. Intermediate between *R. fuscus* and *R. Bellardii*. Distinguished from *R. fuscus* by shorter hair and subsessile glands on st. and pan.-rach., weaker *prk.*, lts. much more finely toothed with shorter point, and *sep.* usually rising on fall of *pet.*; from *R. Bellardii* by the more divided l. comparatively small lts. long pan. and lack of glandtipped bristles and long red *stkd. gl.* In the crowded subsessile glands on st. and rach. this sp. occupies a position among the *Sub-Bellardiani* analogous to that held by *R. rudis* among the *Radulae*, though in other respects these two sp. have but little in common.

77. *R. thyrsiger* Bab. in *Journ. Bot.* 1886, 226; not of Banning and Focke. *R. rhenanus* Genev. (not of P. J. Mueller). *R. Bloxamii* *Fl. Plym.* p. 122. Cf. *Journ. Bot.* 1888, 379; *B. E. C. Rep.* 1888, 208, and *E. B.* ed. 3 Supp. p. 97. *St.* arcuate-prostrate, bluntly angled, striate, fuscous or purplish-red, somewhat glaucous, with much partly patent, partly appressed hair, many short *acic.* and *stkd. gl.* and some short stout-based *prklets.* *Prk.* nearly confined to the angles, rather unequal, declining or falcate from long stout base. *L.* 3-5-nate. *Lts.* with irregular compound teeth, strigose above, paler and thinly hairy beneath; *term.* obtusangular-ovoblate, with moderate cuspidate-acuminate point, subcuneate entire base, and stalk about $\frac{1}{2}$ its length. *Pan.* lax, pyramidal, the upper part elongate, nearly cylindrical, with many erect-patent mostly 1-2-flowered branches and numerous simple l.; *rach.* and long *ped.* with dense patent hair, many sunken *stkd. gl.* and *acic.* and declining acicular *prk.* *Fl.* very showy. *Frt.-sep.* at first patent or erect, ultimately reflexed. *Pet.* usually large, narrow, pinkish. Pink stam. far exceeding red *sty.* Young carp. thinly hairy.

Set, No. 97. Bushy places and hedges. Fairly abundant locally in the extreme south-west of England. E. Sussex. Closely allied forms apparently not specifically distinct, N. Hebrides and Co. Westmeath.

V.C. in G. Britain 4 [2]. Irish Co. [1]. Endemic?

A very distinct-looking plant with its remarkably hairy st. and rach., long nearly naked pan., numerous 1-2-flowered long-pedicelled branches and handsome fl. Considerably unlike *R. Bloxamii*, though with it apparently somewhat allied to *R. thyrsiflorus*. In many respects intermediate between *R. micans* and *R. oigocladus*, but with rather more unequal *prk.* than either.

SECT. III. Hairs on st. rather thinly scattered or nearly absent.

L. mainly 3-nate.

a. Sep. clasping young *frt.*, mostly reflexed ultimately.

78. *R. Lintoni* Focke ex Babington in *Journ. Bot.* 1887, 331. *R. lucens* Linton. *R. laetus* Linton. St. soon prostrate, angular, usually subglabrous, glaucous, with a good many slender unequal *acic.* and *stkd. gl.*

Prk. rather few, very slender, unequal, nearly confined to the angles, declining, rarely somewhat falcate, subulate from small base. *L.* 3-nate, very rarely 4-5-nate-pedate. *Lts.* rather thick, flat, shining and strigose above, hairy and somewhat greenish-felted with prominent ribs beneath, with crowded finely pointed teeth; *term.* rather roundish-ovovate-acuminate, with long point, entire base, and stalk rather more than $\frac{1}{3}$ its length. *Pan.* cylindrical, lax below, with racemose-corymbose top and usually two or three simple l.; branches few-flowered erect-patent; *ped.* and *wavy rach.* greyish-felted and hairy, with very unequal and only partially sunken stkd. *gl.* a few acic. and very slender declining prk. *Sep.* rising on fall of pet., ultimately reflexed. *Stam.* exceeding sty. *Carp.* glabrous.

Set, No. 96. Heathy pastures and woods. Apparently rare. Norfolk, Somerset, Monmouthshire. Endemic?

A rather small well-marked plant. Somerset and Monmouthshire spns. seem hardly different from the Norfolk type except in their more hairy st.

79. *R. longithyrsiger* Bab. in *Bot. Gaz.* i. 121 (1849)—as *R. pyramidalis* Bab. (not of Kaltenbach). *Bab. Man.* ed. 3, 101. *Journ. Bot.* 1878, 176; 1886, 73 and 232. *R. longithyrsiger* Lees ms. 1849. St. long, prostrate, bluntly angled, striate, rather thinly hairy, purplish in exposure, with many short subequal acic. and stkd. gl. *Prk.* short, strong, almost confined to the angles, subequal, declining. *L.* mainly 3-nate, with a few 4-5-nate on strong st. *Lts.* subequal, nearly uniform, thin, convex, with shallow even teeth, opaque and strigose above, paler and (except when young) hard with short hairs beneath; *term.* obovate-cuspidate, rarely almost roundish, with short or moderately long point, emarginate or nearly entire base, and stalk $\frac{1}{4}$ to $\frac{1}{3}$ its length. *Pan.* conspicuously pyramidal when well developed, with long strongly ascending racemose lower branches, narrowly cylindrical when small; the ultra-axillary part fairly long, almost or quite racemose, sometimes with one or more ovate-acuminate simple l.; *rach.* and *ped.* straight, rigid, grey-felted, with short hairs and densely crowded short purplish stkd. gl.; acic. and acicular prk. usually few. *Sep.* narrow, attenuate, clasping young frt., loosely reflexed later. *Pet.* narrow, white (in weak plants small greenish-white), often more than 5 in number. *Stam.* unequal, the longer ones exceeding pink-based sty. *Frt.* large, well flavoured. Young carp. pubescent-glabrescent.

Set, No. 25. Chiefly in damp hilly woods and other shady places. Very abundant locally in S.-W. England and Wales. W. Kent. Will probably be found in Ireland.

V.C. in England and Wales 13 [2]. Endemic?

'This bramble . . . not unfrequently has strong shoots of the year terminating in an immense pan.; such shoots sometimes giving out 2 or 3 barren branches from the lower portion of the st., which branches root at their ends just as do ordinary barren ones. I have seen such a shoot, only 2 or 3 feet long, with no less than 4 long secondary shoots for rooting; one proceeding from the joint next below the first of the pan.-branches' (Briggs, *Fl. Plym.* p. 127). In suitable localities the prostrate st. is often of great length, forcing its way for yards in dense thickets and sending up numerous slender racemose and subracemose pan. with singularly straight rach. and ped., very narrow whitish pet. and narrow clasping frt.-sep. The l. are mostly small and the lts. subequal. Lees seems to have published no description. That given in *Bab. Rub.* is admirable.

botryeros var. or subsp. nov. *R. Lejeunei* Briggs, *Fl. Plym.* 126. *St.* glaucous, less angular, often subglabrescent, with fewer stkd. gl.; *prk.* and *acic.* many, unequal, scattered; l. rather more frequently 4-5-nate;

Lts. usually truncate-mucronate, larger, more narrowed towards base, with some teeth patent; pan. less rigid, usually more compound and more interrupted. Fl. large, showy. Pet. pure white or faintly pinkish. Young carp. hairy.

Not in Set. Chiefly in sunny spots. Local. Cornwall, Devon, Herefordshire, Flint. Endemic?

Dr. Focke has suggested the name for this plant, which was considered distinct by Mr. Briggs. Possibly only a strong *forma aprica* of *R. longithrysiger*, but diverging from it towards *R. oigocladus* and *R. Lejeunei*. In S. Devon observed only in open spots and not in the immediate neighbourhood of either *R. longithrysiger* or *R. oigocladus*, which however are frequent there. In Herefordshire woods and in Hawarden Park the Rev. A. Ley finds plants which are very nearly allied, if not identical. There is also a locally abundant Jersey plant which is similar in most respects, though with st. l. chiefly 5-nate and pan. broad and straggling.

b. Frt.-sep. normally reflexed throughout.

80. *R. foliosus* Wh. & N. in *Bluff & Fing. Comp. Fl. Germ.* i. 682 (1825); not of early British authors nor of Gremli. *R. Güntheri* Bab., *R. flexuosus* P. J. Muell., *R. derasus* Lej. & Muell., *R. saltuum* Focke. See *Journ. Bot.* 1890, 133; 1892, 334. St. arcuate-prostrate, climbing in thickets, rather bluntly angled, thinly hairy, purplish-red or fuscous, with many short subequal acic. and stkd. gl. and short tubercles or prklets. Prk. many, weak, nearly equal and chiefly on the angles, declining. *L. mostly 3-nate*, with a few 4-5-nate on the stronger st. *Lts. nearly uniform*, subcoriaceous, finely serrate, strigose above, *ashy-felted* beneath especially when young; *term. broadest near the middle, very gradually acuminate, usually much narrowed to the entire or emarginate base*, with stalk about $\frac{1}{3}$ its length. *Pan. long, narrow, interrupted below, with many short few-flowered often fasciculate branches above and several ovate-acuminate simple l.; rach. remarkably flexuose; rach. and ped. felted with short hair and crowded subsessile glands; longer stkd. gl. very rare; acic. and slender acicular prk. variable in quantity; upper l. whitish-felted beneath.* Sep. very white-felted within, ashy-felted glandular and aciculate externally, mostly reflexed in frt. Pet. narrow, pink or white. Stam. about equalling red or greenish sty. Young carp. pubescent or thinly hairy.

Set. No. 43. Damp woods and bushy places. Widely distributed in S.-W. and Mid. England; often extremely abundant. Much rarer in the north, in Wales and Ireland. Unknown in Scotland.

V.C. in England and Wales 31. Irish Co. 2.

Germany! Switzerland. France.

A very handsome plant; usually distinguished readily by its peculiar foliage and long narrow wavy pan.

(*R. acutifrons* A. Ley.) See Group XIII., *Bellardiani*, p. 90.

GROUP XII. KOEHLERIANI (*Hystrices* Focke). See pp. 6, 17.

SECT. 1. Prk. somewhat scattered but chiefly on angles. Prk. and acic. rarely glandtipped. Intermediate arms only fairly many.

*a. Prk. not very unequal; all of moderate length (except sometimes in *R. hostilis*). Stkd. gl. on rach. rarely very long.*

81. *R. rosaceus* Wh. & N. in *Bluff & Fing. Comp. Fl. Germ.* i. 685 (1825). *R. heteracanthus* Lej. *R. aculeatissimus* Kalt. St. hardly arched at base, procumbent or climbing, indistinctly angled, red-brown or purplish, subglabrous or somewhat hairy, with a good many tubercles unequal prklets and stkd. gl. and some intermediate prk. on the faces.

Large prk. subequal chiefly on angles, strong but rather short, nearly patent or slightly declining. L. 3-5 nate. Lts. broad, with compound uneven teeth, thinly strigose above, paler and hairy on the nerves beneath; term. roundish, with fairly long cuspidate-acuminate point, cordate or subcordate base, and stalk about $\frac{1}{3}$ its length; lat. lobate-gibbous below. Pan. broad, diffuse, narrowed to the roundish-truncate top, with long ascending lower branches; very glandular and prickly; rach. and ped. somewhat whitish-felted, with rather short patent hair, crowded sunken purple stkd. gl., fairly many longer ones, a few unequal bristles or slender acic. (very rarely glandtipped) and many rather short slender subpatent or declining prk. Sep. usually long-pointed, glandular, loosely reflexed or ascending in frt. Pet. broad, usually bright pink. Stam. at first exceeding sty. Young carp. reported glabrous by Dr. Focke, seem mostly pubescent-glabrescent with us.

Set. No. 21. Wood borders and cleared spots in woods. The type as yet known with certainty only in Warwickshire and a few S.-W. counties. As a variable aggregate distributed through the greater part of England and Wales and several Irish counties. Mid.-Perth and E. Perth.

W. Germany. Belgium. ?France.

The above description covers only the type and one or two of the most closely allied forms; but the species as found in Britain is very inconstant, including some forms (vars. *infecundus* and *silvestris*, e.g.) which might almost as well be placed among the *Radulae*. From *R. Koehleri* itself and its nearest allies *R. rosaceus* may generally be distinguished without difficulty by the dark colour of st. and rach., the shorter prk., the less strongly marked series of slender arms of all kinds, and (in type) the broader roundish lts. In all these respects var. *hystrix* occupies a place distinctly nearer to *R. Koehleri*, while linked to *R. rosaceus* by the plant, so frequent in Mid. England, for which Mr. Druce in his *Fl. Berks* (p. 181) has suggested the varietal name *bercheriensis*. This is strongly rosacean in pan. while hardly distinguishable from var. *hystrix* in l. and armature.

Var. *hystrix* (Wh. & N.) in *Bluff & Fing. Comp. Fl. Germ.* i. 687 (1825). *St. more distinctly angled, hairy, usually very strongly armed with unequal stout-based prk. and prklets and some long glandtipped acic.* L. more frequently 5-nate. Lts. usually much narrower, with finely pointed incised or incised-lobate compound teeth, pubescent beneath; term. usually ovate or somewhat obovate, with longer gradually acuminate point, and less cordate or nearly entire base. Pan. rather long and narrow, with short erect-patent branches; rach. and ped. strongly armed with prk. partly falcate, crowded unequal stkd. gl. and a good many long glandtipped acic. and bristles. Sep. loosely embracing frt. Pet. pink.

Set. No. 98. Heaths and wood borders. Rather widely distributed in W. England and Wales; more thinly elsewhere.

V.C. in Great Britain 40 [8]. Irish Co. 3 [2].

Germany.

As Dr. Focke has stated in *Journ. Bot.* 1890, 134, 'In dry spns. it is difficult to trace the limits between *R. hystrix* and *R. Koehleri*.' Usually, however, *R. hystrix* may be distinguished by clasping frt.-sep. pink pet. stouter prk. and fewer slender bristles. Weihe's type, found by him in a single locality near Mennighüffen, has disappeared from that neighbourhood. It had crowded very unequal prk. with narrow lts. and roundish pet. 'Near Bremen, in a wood, but in a single corner only,' Dr. Focke has found a plant differing from this 'only in having broader lts. and narrower pet.', and he speaks of other forms 'occurring here and there' approaching *R. adornatus*. Widespread and somewhat variable as our British *hystrix* is, I do not remember any bushes with roundish petals.

The Rev. R. P. Murray's var. *silvestris* (*Fl. Somers.* p. 116, *Journ. Bot.* 1894, 47), Set, No. 99, may be considered a weak woodland broad-paniced form of var. *hystrix*, and Prof. Babington's var. *Lingua* another very local form (see *Journ. Bot.* 1892, 338).

Subsp. *infecundus* Rogers in *Journ. Bot.* 1892, 338. Var. *hystrix* Bab. (in part). *R. thrysiflorus* Bab. (in part). *R. radula*, b. *hystrix* of Bloxam and Coleman. *St.-prk.* usually much smaller, with long stout base, still more nearly confined to angles than in type, though often more unequal; *intermediate prk.* and *long acic.* few or none. 5-nate l. many except in weak, shade-grown plants. *Lts.* yellowish; paler and *very softly hairy beneath*, with principal teeth often patent, exceptionally thick in sunshine; term. oval, with emarginate base. *Pan.* very *lax, pyramidal*, with narrow truncate top; upper branches often only 1-2-flowered; rach. and ped. felted with short hair and very crowded purplish unequal stkd. gl. Cal. less deeply divided even than in type; sep. externally dark with pale margin, very glandular and aciculate, with long points rising on the half-withered pet. and usually clasping the poorly developed frt.

Set, No. 70. Woods and wood borders. Widely though somewhat unequally distributed throughout Great Britain; often very abundant. Apparently rather rare and less strongly marked in Scotland.

V.C. in G. Britain 32. Brittany!

Usually an exceedingly well-marked form. In sunny spots the frt. is often abundant; but even then the frequent early rising of the sep. gives a somewhat unfruitful look to the pan. as a whole. The st.-armature is so nearly radulan that the position formerly given to this plant under *R. radula* might perhaps be maintained if the chief prk. were stronger and more nearly equal and the l. at all white-felted beneath. The pan.-armature even in the strongest plants is only partially Koehlerian, though the stkd. gl. are commonly more unequal than in the *Radulæ*.

Subsp. *Purchassianus* Rogers in *Journ. Bot.* 1895, 102. *R. Reuteri* Bab. (1878). *R. obscurus* of British authors from about 1890 to 1895 (see *B. E. C. Rep.* 1890, 295, and *Journ. Bot.* 1892, 339). *St.* roundish, *densely prickly and hairy*. *Prk.* more unequal and scattered, often strongly declining or somewhat falcate, with long broad base. *L.* mostly 5-nate-pedate, but many 3-4-nate. *Lts.* narrow, strigose on both sides, with crowded irregular sharply cut teeth; term. obovate-rhomboidal, with long acuminate point and entire base. *Pan.* *nearly cylindrical*, with narrow rounded ultra-axillary top and 1-3 flowered branches; *rach.* and *ped.* *densely villous and glandular*, purplish-brown; stkd. gl. many, chiefly sunken; prk. many slender, nearly patent, a few falcate. *Sep.* shaggy, densely aciculate and glandular, *quickly rising and remaining erect in frt.* Pet. narrow, pinkish. Stam. pink. Frt. small and only occasionally abundant, very sweet.

Set, No. 22. (*R. obscurus* Kalt.) Woods and open bushy places. Only locally abundant in a few counties from Monmouth and Gloucester north-east to Derby.

V.C. in G. Britain 5 [4]. Endemic?

A shaggy-looking darker and far more prickly and hairy plant than var. *infecundus*; in some respects intermediate between it and var. *hystrix*, in others approaching plants of the *hirtus* group.

Subsp. *adornatus* P. J. Muell. ex Wirtgen in *Flora* xlii. 234 (1859). *R. atro-rubens* Wirtg. (and of Bloxam). *R. exsecatus* Bab. *R. foliosus* Bab. (in part). *R. fuscus* Blox. (in part). Near var. *hystrix*, but readily distinguished from it by *prk. on angles of st. and on pan.-rach. very strongly declining*, lts. usually very slightly hairy beneath and harsh to the touch, term. lt. usually broadest a little below the middle and thence narrowed very gradually and evenly to the long acuminate point; pan.

lax, with short ascending lower branches and *narrow cylindrical ultra-axillary top*, with 1-3-flowered patent or divaricate branches; rach. very wavy below, usually straight above; rach. and ped. with crowded declining prk., sunken stkd. gl. and some (usually only a few) other glandtipped organs. The st. is pubescent and glaucous, fuscous or purplish-brown, with its large prk. chiefly on the angles and few strictly intermediate ones on the faces, where stout-based prklets and tubercles are abundant. Fl. small. Sty. and stam. bright red after fall of pet.

Set. No. 71. Woods and thickets. Widely spread in England from Cornwall and Kent to Yorkshire and Cheshire, and locally abundant.

V.C. in England and Wales 16 [2]. Irish Co. 2.

Germany.

Placed by Dr. Focke in close alliance with var. *hystrix*. He regards our plant however as an exceptionally strong form; and it is so constant and abundant in England and so conspicuously distinct from everything that we call *hystrix*, that it seems necessary to treat it as a well-marked subsp. In England the pet. seem to be always white, but they are pink in the Rev. E. S. Marshall's Mayo and Galway plant, which has less strongly declining prk. with less gradually acuminate term. It., and seems on the whole nearer to the ordinary German form.

Subsp. *Powellii* Rogers in *Journ. Bot.* 1894, 47. St. prostrate, conspicuously angular and hairy. *L.* always small, mostly 5-nate-pedate. *Lts.* thin, remarkably narrow, with compound deeply incised finely pointed teeth, dark green and usually quite glabrous above; term. narrowly obovate or ovate, with long attenuate-acuminate point and entire or emarginate base. *Pan.* *lax*, usually narrow, with all the branches ascending; top corymbose, usually with one or more simple l.; rach. with short hair very unequal stkd. gl. and long-based, partly falcate, prk. *Sep.* strongly reflexed in fl. and frt. *Pet.* small, narrow.

Set. No. 100. Abundant and remarkably constant over the more elevated parts of Epping Forest. Found also sparingly in W. Kent and Oxfordshire. Endemic?

Clearly a small rosaceous form, recalling *R. echinatus* in the strongly reflexed sep. and incised l., but differing from it considerably in armat. and in the thinness of the narrow green lts. It has grown quite true to type in Mr. Powell's Cambridge garden from Epping Forest seed.

82. *R. hostilis* Muell. & Wirtg. in *Hb. Rub. Rhen.* ed. i. n. 139, 178 (1860); ed. ii. n. 67, 98. See *B. E. C. Rep.* 1896, 518. St. prostrate, long, bluntly angled, with a good deal of scattered, partly appressed, partly patent hair, somewhat glaucous, reddish-brown, with many unequal slender acic. and stkd. gl. Prk. stout-based, with very slender points, chiefly on angles and not very unequal, mostly somewhat declining or slightly curved. L. chiefly 5-nate, often large. Lts. rather thin, narrow, with very long points and compound finely pointed teeth directed forwards, dark green strigose above, paler and softly hairy beneath; term. obovate or nearly oval, with long attenuate point, narrow entire or emarginate base, and stalk $\frac{1}{4}$ to $\frac{1}{3}$ its length. Pan. slender, rather short, narrow, cylindrical and usually racemose above, with few racemose or subracemose branches below; rach. and ped. felted, with short hair, many sunken gl., a few longer ones and some (often many) unequal bristles acic. and slender declining and falcate acicular prk. Sep. shaggy, very glandular and aciculate, narrow, attenuate, usually clasping in frt. Stam. far exceeding sty. Young carp. pubescent.

Not in Set. Woods and bushy heathy ground. Distribution as yet very imperfectly known.

V.C. in England and Wales 5.

Germany.

I have seen no continental spns. of *R. hostilis*, and know but little as to its range of variation. The British plants so named for me by Dr. Focke seem just intermediate between *R. hystrix* and *R. viridis*. From *R. Koehleri*, var. *dasyphyllus* (*R. pallidus* Bab.), they differ conspicuously in its. thin, more narrowed below, with far longer point and all the teeth directed forwards, pan. shorter, more compact above, and far less interrupted below, with frt.-sep. usually clasping; as well as in the weaker habit, darker colouring, and (generally) slenderer and less distinctly Koehlerian armature.

b. Prk. extremely unequal; some very long. Stkd. gl. on rach. passing into glandtipped acic.

83. *R. fusco-ater* Weihe in *Bluff & Fing. Comp. Fl. Germ.* i. 681 (1825); not of Wirtgen. *R. badius* Bab. (in part). *R. verrucosus* Lees. *Journ. Bot.* 1894, 48. St. nearly prostrate, long, bluntly angled, striate, very hairy, dull purplish-brown, with many unequal short stout-based prklets tubercles and acic.; stkd. gl. also very unequal, comparatively few. Prk. exceedingly unequal from long broad base, very hairy, remarkably variable in direction, mostly somewhat declining, a few falcate. L. mostly 5-nate-pedate. Lts. thick, with finely pointed somewhat compound but not deeply incised teeth, full green and rather closely strigose above, soft beneath with grey-green felt and short hair; term. roundish-ovate or more narrowly ovate, with acuminate point, cordate or subcordate base, and stalk about $\frac{1}{2}$ its length. Pan. usually long and interrupted; lower branches distant racemose erect-patent, upper close 1-3-flowered, nearly patent or divaricate; rach. and ped. villous-felted, with most of the stkd. gl. sunken, armed much like st. Fl. rather small. Frt.-sep. erect or patent. Pet. bright red. Stam. red, stiffly upright, somewhat exceeding sty. Young carp. hairy or glabrous.

Set. No, 128. Bushy places. With us as yet certainly found only in England and chiefly in the Midlands. Apparently very local.

V.C. in England 7 [4].

Germany.

A dark shaggy-looking plant about intermediate between *R. pyramidalis* and *R. Marshalli*, though in armature nearer the latter and strong forms of *R. hystrix*.

SECT. II. Prk. acic. bristles and intermediate arms of all kinds very numerous, indiscriminately scattered, very unequal and not unfrequently glandtipped.

a. Pet. white.

84. *R. Koehleri* Wh. & N. in *Bluff & Fing. Comp. Fl. Germ.* i. 681 (1825). St. arcuate-prostrate or climbing, bluntly angled or roundish, pale yellowish-brown or brownish-red, thinly hairy, with crowded very unequal scattered prk. acic. bristles and stkd. gl., all usually slender and patent or slightly declining; even the longest bristles and acic. not unfrequently glandtipped. L. mostly 5-nate-pedate. Lts. rather thin, with uneven compound teeth, glabrescent and somewhat shining above, paler with short hair beneath, all stalked, rarely imbricate; term. oval or somewhat obovate, with fairly long acuminate point, subcordate base, and stalk about $\frac{1}{2}$ its length. Pan. nearly cylindrical, open, somewhat narrowed to the blunt top, with several simple l. above, rather lax throughout; branches mostly long and nearly patent, umbellate-racemose, 3-5-flowered; rach. and ped. felted, with rather short patent hair, very crowded mostly patent long slender prk. acic. bristles and stkd. gl., —a large but varying proportion of these arms being glandtipped as on st. Sep. very glandular and aciculate, normally reflexed in fl. and frt.,

but sometimes becoming patent on term. fl. Pet. white. Stam. exceeding sty. Young carp. glabrous or slightly pubescent.

Set, No. 127 (a rather weak subglabrous form). Woods and bushy places. The type seems rather widely but very thinly distributed through England, Wales and Ireland. Apparently rare in S. England and perhaps absent from Scotland. Nearly allied forms more frequent.

V.C. in England and Wales (typical or nearly so) 25. Scotland [3]. Irish Co. 3 [5].

Germany.

Considered by Dr. Focke to be about midway between *R. villicaulis* and *R. hirtus*. For differences between *R. Koehleri* and *R. rosaceus* with its var. *hystrix*, see above under the two latter. *R. dumetorum* var. *ferox* is often very similar in armature, but it may usually be distinguished at once by its more imbricate lts. subsessile bas. lts. large roundish pet. and clasping frt.-sep.

Var. *cognatus* (N. E. Brown) in *E. B. ed. 3, Supp.* p. 101 (1892). *R. debilis* Bab. (in part), *Journ. Bot.* 1895, 102. Very strong; with *stout-based large prk.*, but *fewer intermediate arms*. St. somewhat glaucous. Lts. *thick, softly hairy beneath* (sometimes almost velvety), with *very compound deeply incised and somewhat sinuate toothing*; term. roundish or broadly ovate *cordate*. Pan. very strongly developed *broad*, less leafy above, with rounded or truncate-corymbose top and several patent-erect many-flowered branches. *Frt.-sep. subpatent, then loosely reflexed*.

Set, No. 41. Bushy places. From the counties of Hereford, Radnor and Flint eastward to Norfolk, and southward to Surrey and Sussex; locally abundant.

V.C. in England and Wales 11. Irish Co. 3. Endemic?

Variable in armature and size of pet., but usually a very well marked var. or subsp. The St. Budeaux (Devon) plant, formerly placed here by Prof. Babington, seems to be an obscure local form. The Linton Wood plant (also put with it in *E. B. ed. 3, Supp.*) is *R. regillus* A. Ley. See above, p. 67, and *Journ. Bot.* 1896, 217.

b. Pet. pink.

Subsp. *dasyphyllus* Rogers in *Journ. Bot.* 1899, 197. *R. pallidus* Bab. (not of Weihe & Nees, nor of Genevier). *R. saxiculus* Bab. in part. Differs from *R. Koehleri* by st. more angular and sometimes furrowed, usually darker, *densely hairy, with fewer intermediate prk.* L. more frequently 3-4-nate. Lts. *thick, coriaceous, felted or very softly hairy and usually much paler beneath*, with most of the *principal teeth patent or recurved*. Pan. *long, very narrow*, with very distant short few-flowered ascending lower branches and mostly 1-2-flowered patent upper ones; usually with comparatively few long glandtipped acic. and bristles on rach. and ped. Pet. pink. Frt. abundant, oblong.

Set, No. 45. Woods, bushy places and hedges; especially in hilly districts. Apparently far the most common glandular bramble in N. and Mid. England and Wales. Rarer in S. England and (so far as yet known) in Scotland and Ireland.

V.C. in G. Britain 68. Irish Co. 3. Endemic?

Usually a very distinct plant, with its peculiar foliage and narrow lax pan. When normal the numerous bristles and slender acic. so characteristic of *R. Koehleri* are present in abundance on st. and pan.-rach., and a fair number of them are glandtipped. In weaker states or forms the armature is much less Koehlerian. Intermediate prk. are almost invariably fewer.

85. *R. plinhostylus* Genev. in *Mém. Soc. Acad. M. & L.* xxiv. 108 (1868); *Ess. Mon.* No. 73; *Journ. Bot.* 1887, 22. As represented in Set,

No. 72 (Foxholes Wood, Dorset), a handsome Koehlerian or Sub-Koehlerian form, which seems on the whole rather nearer to *R. mutabilis* than to *R. Koehleri*, though sometimes nearly or quite as strongly armed as the latter. The *long lts.* narrowed at both ends with attenuate-acuminate point and pale greyish-green under-surface and the *many-flowered pan.-branches* with small frt., *loosely reflexed* or subpatent sep. and pinkish pet. and sty. are conspicuous features of this Dorset plant, though less marked in the small Minster Valley (Cornwall) form from which Prof. Babington drew his description in *Journ. Bot.* 1887, 22. Other British localities suggested are near Borgue, Kirkcudbright, and woods opposite Tintern, W. Gloucester. At present can only be placed provisionally in our list, though the Dorset plant at least seems to agree fairly well with Genevier's description.

Other plants allied to *R. Koehleri* which have been found in Britain, each in one locality, are *R. distractus* Muell. & Wirtg. (Rudyard, Staffs., W. H. Painter) and *R. insolatus* Auct. (Shooter's Hill, W. Kent, A. H. Wolley-Dod). The former seems hardly distinct from weak hairy states of *R. Koehleri*; while of *R. insolatus* Dr. Focke writes (in litt. 1894 or 1895) that he thinks it 'will prove to be a *status horridus* of various glandular Rubi.' It seems to consist of some ill-defined forms intermediate between *R. Koehleri* and *R. hirtus*.

86. *R. Marshalli* Focke & Rogers in *Journ. Bot.* 1895, 103. *R. Koehleri*, var. *hirsutus* Rogers, *Journ. Bot.* 1892, 340. *St.* angular, deeply striate or subsulcate, very hairy in type, dull reddish-brown, *densely clothed with very stout-based prklets and unequal acic.* and *stkd. gl.* *Prk.* scattered, *remarkably unequal, the longest usually quite patent with long compressed base.* *L.* small, 3-5-nate-pedate. *Lts.* sub-coriaceous, with large compound incised teeth, strigose above, *thickly softly hairy beneath*; term. ovate or roundish, with moderately long acuminate point, cordate base, and stalk $\frac{1}{3}$ to nearly $\frac{1}{2}$ its length. *Pan.* *very elongate, in great part ultra-axillary and narrowed almost to a point at the top, with long lower branches like secondary pan.* erect-patent at first, patent or even divaricate later; rach. and ped. villous-felted and armed like st., only with still closer and more unequal patent prk. (a few about $\frac{1}{3}$ in. long). *Sep.* long-pointed, shaggy, with long slender acic. and *stkd. gl.*, subpatent in young frt., *loosely reflexed* later. *Pet.* narrow, pink. *Pink stam.* exceeding sty. *Young carp.* dark brown, rather hairy.

Set. No. 46. Bushy places and heaths. Locally abundant in several counties across Mid. England and in the south-east.

V.C. in England 12. Irish Co. [2]. Endemic?

A well-marked type, in most respects intermediate between *R. Koehleri* and *R. fusco-ater*. The prk. and long acic. are not unfrequently gland-tipped as in *R. Koehleri*; but the long bristles so characteristic of that species are more uncertain in their appearance.

Var. *semiglaber* Rogers in *B. E. C. Rep.* 1895, 479. Cf. *Journ. Bot.* 1895, 103; 1899, 197. *St.* only thinly hairy or glabrous. *Prk.* very crowded, *not so uniformly patent, rarely so long*, occasionally with a few somewhat falcate ones intermixed. *Mature l.* often rather larger, *less hairy*, or nearly naked beneath, with teeth more irregular and usually less deeply incised. *Pan.* *broader* with much less hairy rach. and ped., larger fl., frt.-sep. often clasping, and young carp. glabrous or nearly so.

Not in Set. Open bushy places and hedges. Apparently not uncommon in N. Wales and Herefordshire.

V.C. in Wales and England 7. Endemic?

Undoubtedly variable, but apparently better placed here than with the strong forms of *R. hystrix* which it somewhat resembles. The comparatively small l. long pan.-branches like secondary pan. and numerous

patent or subpatent prk. especially connect it with *R. Marshalli*. The Breconshire and W. Herefordshire plant is abundant in hedges and at times recalls *R. dumetorum*; but its rather large drupelets are neither glaucous nor caesian in flavour. It has very showy fl. with deep pink pet. stam. and sty.

GROUP XIII. BELLARDIANI (*Glandulosi* Focke). See pp. 6, 18.

SECT. I. Stkd. gl. on pan. conspicuously unequal; often twice as long as diameter of ped. Glandtipped bristles often numerous.

a. Frt.-sep. normally erect or patent (sometimes loosely reflexed in *R. Durotrigum*).

(i.) L. chiefly 5-nate.

87. **R. viridis** Kalt. *Fl. Aach. Beck.* p. 283 (1845). Includes *R. incultus* Wirtg. (1862). St. long, prostrate, roundish or very bluntly angled, considerably hairy or subglabrous, with many unequal acic. bristles stkd. gl. and slender declining large-based prk. and prklets. L. mostly 5-nate. Lts. pale green, usually thin and brittle, shining and slightly strigose above, softly hairy and subglabrescent beneath, with very irregular compound but mostly shallow teeth and petiole and petiolules clothed like st.; term. ovate or oval, with acuminate or cuspidate-acuminate point, slightly emarginate or rarely cordate base, and stalk hardly $\frac{1}{3}$ its length. Pan. lax, pyramidal or nearly cylindrical, with patent or subpatent few-flowered long-peduncled branches, often racemose or subracemose above; straight rach. and ped. densely clothed with unequal bristles stkd. gl. and acicular prk. Sep. attenuate-acuminate, clothed like ped., patent or clasping in frt. Pet. long, narrow, white or slightly pinkish. Stam. white or reddening, far exceeding sty. Young carp. pubescent.

Set. No. 23. Woods and open places. From Somerset and Kent to the Midlands. Local.

V.C. in England and Wales 16 [3]. Irish Co. 1 [3].

Germany.

Distinguished from *R. pallidus* Wh. & N. by its more unequal armature less compound pan. and lts. often broader and with less conspicuously long points.

88. **R. Durotrigum** R. P. Murray in *Journ. Bot.* 1892, 15. (Cf. 1893, 4.) St. prostrate or climbing, bluntly angled, with very few inconspicuous hairs, yellowish on lower side, purplish-red above, densely prickly aciculate and bristly, with scattered stkd. gl.; prk. and acic. slender, unequal, mostly declining, with very brittle points; a few falcate; the longer acic. and bristles often glandtipped. L. large, pale green, chiefly 5-nate-pedate. Lts. remarkably broad, thinly strigose above, shining and only slightly hairy on the veins beneath, with large compound finely pointed deeply incised or lobate teeth; term. roundish-ovate, with long gradually acuminate point, cordate or emarginate base, and stalk less than $\frac{1}{3}$ its length. Pan. pyramidal, with distant patent-erect racemose branches below and a rather close top which is either leafless or furnished with a few simple or 3-fid l.; topmost branches short 1-2-flowered, intermediate irregularly racemose-cymose, sometimes fasciculate; lower l. exceptionally large, like those of st.; wavy rach. and ped. felted with short hair, armed like st. but more densely glandular and sometimes with only acicular prk. Frt.-sep. patent or loosely reflexed. Pet. small pinkish. Stam. and sty. subequal. Young carp. thinly hairy.

Set. No. 24. Woods and bushy ground on chalk and tertiary heathland. Locally abundant in E. Dorset. Not as yet found elsewhere, though there is an Anglesey plant that recalls it. Endemic?

A very distinct and strikingly beautiful bramble. Nearest on the whole to *R. viridis* and a true member of the *Bellardiani*, but also in some respects recalling *R. rosaceus*.

(ii.) L. chiefly or wholly 3-nate.

89. **R. divexiramus** P. J. Muell. ex Genevier *Mon. Rub.* ed. ii. 88 (1880). *Journ. Bot.* 1893, 4. St. petiole rach. and ped. armed much as in *R. viridis*. St. long, prostrate, slender, roundish, glaucous, rather considerably hairy, dark purple. L. 3-5-nate-pedate, mostly 3-nate with lat. lt. deeply lobed or gibbous. Lts. yellowish-green, usually rather thin and flexible, becoming subcoriaceous in exposure, glabrescent if not actually glabrous above, soft with many short shining hairs beneath, with fine closely placed compound teeth; term. obovate-obtusangular, with moderate acuminate point, rather narrow emarginate base, and stalk more than $\frac{1}{3}$ its length. Pan. rather broad, slightly narrowing above in the rounded ultra-axillary top, with many fairly close longish patent branches; purple rach. and ped. felted with dense short hair, a good many very slender declining and falcate acicular prk. and very crowded unequal purple stkd. gl. and glandtipped bristles. Sep. long-pointed, conspicuously reflexed on fall of pet., erect later. Pet. oblong distant white, scarcely exceeding sep. Stam. white, then reddening, exceeding sty. Young carp. somewhat pubescent.

Set, No. 47. Woods and heaths. Local. S.-W. England and Leicestershire.

V.C. in England 5.

Distinctly Bellardian and in many respects like *R. viridis*, but also recalling the more Radulan *R. longithyrsiger* and *R. infecundus*. Very constant features are the obovate-acuminate term. lt., the dark purple st. and rach. and the rather broad rounded pan.-top with long erect frt.-sep.

90. **R. Bellardii** Wh. & N. in *Bluff & Fing. Comp. Fl. Germ.* i. 688 (1825). *R. glandulosus* Bell. St. procumbent from low arch, round, purplish-glaucous in exposure, rather thinly hairy, with many short unequal acic. bristles and stkd. gl. Prk. acicular, conical from large base, chiefly declining, some hooked or falcate. L. 3-nate. Lts. sub-equal, light green, rather evenly and finely toothed, strigose over the whole upper surface, less conspicuously so with shorter hair beneath: term. oval or oval-oblong, with moderate cuspidate-acuminate point, subcordate or emarginate base, and stalk usually less than $\frac{1}{4}$ its length; lat. very similar, but somewhat gibbous or rarely lobate-gibbous on the lower side, with very short divaricate stalk. Pan. short; the very few lower branches erect-patent, usually 3-flowered, the upper patent or divaricate, simple, with rather long thin ped.; rach. and ped. felted with close short hair, crowded very unequal red stkd. gl. and acic., some glandtipped bristles and slender patent and subpatent prk. Sep. very aciculate and glandular, with long points embracing young frt. Pet. narrow, white. Stam. short, but usually exceeding styles. Carp. glabrous.

Set, No. 73. Chiefly in moist woods. From Somerset and Hants to Carnarvon and Northumberland, but apparently rather local.

V.C. in England and Wales 14 [8]. Irish Co. [1].

Through the greater part of W. and Mid. Europe to France and N. Italy.

A constant and easily recognised sp. The 3-nate l. with subequal evenly-toothed lts. and the remarkably short few-flowered patent-branched pan. with slender very unequal glandtipped organs on rach. and ped. are marked features. Plants with some 5-nate l. have apparently been found, but they are quite abnormal. The 'var. *dentatus*' of Bloxam and Buntington is made up chiefly (if not wholly) of *R. scaber* forms.

(iii.) L. 3-5-nate.

91. **R. serpens** Weihe in *Lej. & Court. Comp. Fl. Belg.* ii. 172 (1831). Include *R. rivularis* Muell. & Wirtg. St. much as in *R. Bellardii*, but more angular in upper part. Prk. short, declining and falcate. L. 3-5-nate. Lts. unequal, irregularly but usually rather finely toothed, strigose above, paler with short shining hair beneath; term. variable in outline and length of stalk (though usually exceptionally long with short stalk), with long acuminate point and cordate or emarginate base. Pan. short, racemose, narrow, or elongate with several long racemose branches below; rach. and ped. felted with short hair and crowded remarkably slender armature; prk. very fine, subulate; stkd. gl. bristles and acic. (often glandtipped and bent) very unequal, mostly pale straw-coloured or brownish. Sep. embracing frt. Pet. rather long, white. Stam. hardly exceeding sty. Carp. glabrous.

Set. No. 74. Chiefly or wholly in hilly woods. In several W. and S. English counties; also in Bucks. Staffs. and perhaps Stirling; but apparently local.

V.C. in G. Britain 9 [2].

Germany.

Dr. Focke writes (in litt. 1896): 'In the Hartz mountains, at an elevation of 1600-2000 ft., two glandular sp., viz. *R. Bellardii* and *R. serpens*, have been the only brambles I met with. Everywhere they kept quite distinct.' With us *R. serpens* seems the more variable, but it may usually be at once distinguished from *R. Bellardii* by its many 4-5-nate l., unequal longer-pointed lts. and narrower racemose pan. with paler glandular organs and bristles on rach. Usually also the term. lt. is much longer and its stalk proportionately shorter. The vars. *lividus* G. Braun and *R. rivularis* Muell. & Wirtg. seem too closely related to admit of satisfactory differentiation, though the latter is described as having large pet. pubescent carp. and stalk of term. lt. longer.

92. **R. hirtus** Waldst. & Kit. in *Pl. rar. Hung.* ii. 150 (1805). 'St. prostrate from a low base, more rarely climbing, roundish, only indistinctly angled near the top, more or less hairy, densely covered with stkd. gl. glandular bristles and acic. L. principally 3-nate; in strong shoots mixed with 5-nate ones. Lts. coarsely and (in their upper part) often unequally serrate, dark green and strigose above, paler, densely hairy on the nerves beneath; term. 3-4 times as long as its stalk, generally broadly elliptic from a rounded base, gradually narrowed to a short point, in other respects not unfrequently varying in shape. Fl.-branches not seldom sessile, many-flowered; the normal ones on the branches of the 2-year-old st. of moderate size, leafy below; rach. of the inflorescence violet or red-brown with stkd. gl. and many long glandular bristles. Sep. erect after flowering. Pet. oblong, white. Stam. many, rather exceeding sty. Frt. globular, with small drupelets.' Focke in *Koch Syn.* ed. 3. Dr. Focke adds: 'Very polymorphic and widely distributed. . . . The type does not occur in the W. German ranges and Switzerland, but countless indefinable vars. and closely related forms are to be found.'

Not in Set. Hilly woods. As an aggregate perhaps widely though apparently thinly spread through England; but, as in the case of *R. saxicola*, I cannot define it as a sp., and so I have given above only a translation of Dr. Focke's description. For the same reason I add here the total number of British vice-counties from which it has been reported without in any case vouching for the correctness of the record.

V.C. in G. Britain [30]. Irish Co. [2].

By 'sessile fl.-branches' in Dr. Focke's description are meant the luxuriant abnormal pan. so frequently produced in this group (and in *R. longithyrsiger*) at the extremity of the first year st. As a rule, *R. hirtus*

has straight, setaceous prk. hairy carp. and a drooping pan. with violet or dark purple stkd. gl. and long glandtipped bristles,—the stkd. gl. usually extending to the upper surface of the simple floral l. The forms described below as var. and subsp. seem constant and well marked, especially the first two.

Var. *rotundifolius* Bab. in *Ann. Nat. Hist.*, Ser. II, vol. ii. 40 (1848),—as *R. glandulosus* Bell, var. *rotundifolius* Bab. *Bab. Rub.* 252 (1869); not of Weihe, etc. For detailed synonymy see *E. B.* ed. 3, *Supp.* 117. St. stout, rather angular and hairy, striate, yellowish-brown (as is the armature). Prk. mostly short, stout-based, passing into similar prklets, with many unequal acic. and stkd. gl. L. 3-5-nate, often very large. Lts. thin, sub-glabrescent beneath, though pale with close felt or short hair when young, with shallow even teeth; term. roundish-oval, usually with rather short point and stalk and subcordate base; lat. similar, but very gibbous below. Pan. in weak plants nearly racemose, but normally very compound throughout, broad, with long lower branches, long divaricate stout ped. and fairly broad truncate top; the very mixed armature on rach. and ped. mostly very crowded, slender, straight, brownish and (except the prk.) glandtipped. Sep. glandular and aciculate with long points usually erect in frt. Stam. far exceeding sty. Carp. glabrous.

Set, No. 102. Thickets and bushy hedges. Locally abundant in S.-W. corner of England. S. Wilts. Reported (but not seen by me) from several other counties.

V.C. in England 11.

Thuringia (Central Germany)!

A very constant bramble as found abundantly in the extreme S.-W. of England, and quite indistinguishable from a dried spn. in my hb. collected at Ilmenau in Thuringia by F. Areschoug and labelled by him '*R. hirtus* W. & K. forma foliis trifoliolatis ad *R. glandulosum* accedens.' Babington describes the l. in our plant as 'mostly 3-nate,' and I have found them so; but strong 5-nate-leaved bushes are quite common. As he points out in *Bab. Rub.* p. 252, this var. seems to differ from *R. hirtus* chiefly by 'the broadness of the lts., especially the term. one, and the greater regularity of the toothing.' It is usually however exceedingly luxuriant, with very large lts., widely spreading composite pan., and a yellowish-brown tint on st. and armature. From *R. Bellardii* it may be distinguished not only by its very strongly developed composite pan., frequent 5-nate l. and general luxuriance, but also further by its yellowish-brown st., its long stam., and the absence of all gl. and acic. on either surface of the upper l. of its pan. Babington gives '*R. amictus* Müll.' (which I have not seen) as synonymous.

b. Frt.-sep. reflexed or partly subpatent; occasionally erect.

Subsp. *Kaltenbachii* (Metsch.) in *Linnaea* xxviii. 170 (1856). St. bluntly angled, deeply striate, with many stkd. gl. and acic. Prk. strongly declining, subulate, stout-based. L. 3-5-nate; usually a fair number 5-nate-pedate. Lts. large, narrow, irregularly toothed, with the larger teeth recurved, often softly hairy and pale beneath at first, ultimately green on both sides; term. usually narrowed gradually at both ends, especially towards the emarginate or subcordate base, with long point and stalk about $\frac{1}{3}$ its length; interm. similar, with shorter point; bas. narrowly oval. Pan. elongate, usually very large and lax, remarkably pyramidal, drooping; all the branches racemose or rarely subracemose, becoming very gradually shorter up to the pointed racemose top; rach. and ped. densely hairy, with very crowded, unequal, dark stkd. gl. and many slender, declining acic. and prk. Fl. rather showy. Sep. clothed externally like ped., subpatent or loosely reflexed in frt. Pet. long, white or faintly pinkish. Stam. exceeding sty. Carp. glabrous.

Set, No. 48. Woods and wood borders. In several counties from N. Devon to Leicester; but apparently very local.

V.C. in England and Wales 9 [1]. Irish Co. [2].

W. Germany.

In Focke, *Syn. R. G.* 375, given among forms 'related to *R. hirtus*.' To some extent recalls *R. foliosus*, but may readily be distinguished from it by the conspicuously pyramidal pan. with long lower branches and more mixed Bellardian armature, as well as by the narrow, greener, irregularly toothed lts. In its remarkably elongate pointed pan. *R. mercicus* subsp. *bracteatus* alone among British brambles very closely resembles it.

Subsp. *flaccidifolius* (P. J. Muell.) in *Bonpl.* ix. 300 (1861). *Journ. Bot.* 1893, 80. St. bluntly angled, with abundant short hair and very slender mixed armature. L. 3-nate. Lts. thin, subequal, with short strigulose hairs on both sides, irregularly toothed; term. roundish-ovate or slightly obovate, with long gradually acuminate point, emarginate base, and short stalk. Pan. very lax, narrow, wavy, with short few-flowered somewhat fasciculate branches; rach. and ped. densely hairy, with very slender rather pale mixed armature and crowded subsessile glands. Sep. strongly reflexed, with long attenuate points. Pet. narrow. Stam. unequal, mostly exceeding sty.

Set, No. 129. Woburn Sands, Bucks and Beds.

I have seen no authentic continental spns., the above description being made exclusively from a good series of Mr. Linton's plant. In pan. very like *R. foliosus*, while in other respects apparently intermediate between that sp. and *R. hirtus*.

Subsp. *rubiginosus* (P. J. Muell.) in *Pollich.* xvi.-xvii. 207 (1859); not of Lefèvre. *Journ. Bot.* 1895, 104. St. stout, rather indistinctly angled or roundish, very hairy, with crowded rather short stkd. gl. and acic. and stout prk. L. 3-5-nate. Lts. thick and very hairy or even felted with prominent ribs and veins beneath, usually with compound but rather shallow and partly patent teeth; term. roundish-oblong, with acuminate or cuspidate-acuminate point, cordate or subcordate base, and stalk usually more than $\frac{1}{3}$ its length. Pan. narrow, cylindrical, often racemose above with racemose or subracemose lower branches; rach. and ped. densely hairy, glandular and prickly; the purple stkd. gl. mostly short in the type, but in the British plant often having a considerable number of longer ones intermixed. Sep. (purplish with shortly stkd. and subsessile gl.) loosely reflexed after flowering. Pet. rather small, white or pinkish. Stam. usually exceeding sty. Carp. glabrous.

Not in Set. Bushy places. In Kent and a few western counties; local.

V.C. in England and Wales 5. Irish Co. 1.

S. W. Germany.

Reckoned as 'a rather strong form of the *hirtus* group' by Dr. Focke, to whom we are indebted for the application of the name to our British plant. But, as he points out, 'the prk. are rather strong, the stkd. gl. of the pan. are nearly all short' [not always so in our plant], 'the sep. loosely reflexed after flowering, and the lts. very hairy beneath—characters not common among the true *Glandulosi*.' At the same time, while somewhat recalling *R. fusco-ater* and forms of *R. Marshalli* in armature, its resemblance to *R. hirtus* is marked enough in the dark colour of the very crowded stkd. gl. often extending (as in that) to the upper surface of the topmost pan.-leaves, the hairy glaucous indistinctly angled st., 3-5-nate l. and narrow subracemose pan.

Dr. Focke has suggested the name '*R. minutiflorus* P. J. Muell. (non Lange !)' for a bramble that I sent him from a wood border at Highlands, Mereworth, W. Kent, and has added the note 'a form near *R. tereticaulis* P. J. Muell.' I have seen somewhat similar plants from Treville Woods,

Herefordshire, and Seckley Wood, Staffordshire; but further investigation is desirable before the admission of the name into our list. *R. minutiflorus* was published in *Hb. Rub. Rhen.* ed. i. n. 103. The Kent plant has a bluntly angled st. with short large-based prk., the rest of its armature consisting mainly of very short tubercular acic. with a few scattered larger acic. and stkd. gl.; l. 5-nate-pedate; lts. long, term. obovate-acuminate with rather narrow cordate base and long stalk; pan. broadly pyramidal, lax below, with long few-flowered branches and truncate top; rach. and ped. densely clothed with unequal but mostly short stkd. gl; characters which in combination make this plant look intermediate between *R. divexiramus* and *R. tereticaulis*.

SECT. II. Stkd. gl. on pan. almost without exception shorter than diameter of ped. Glandtipped bristles few or none. (Very near Group XI.)

a. Frt.-sep. chiefly patent.

93. *R. acutifrons* A. Ley in *Journ. Bot.* 1893, 13. St. bluntly angled, striate, not conspicuously glaucous, pale reddish-brown, rather hairy, with a good many unequal stkd. gl. acic. and stout-based prklets. Prk. many, mostly nearly equal, *rather stout for this group, strongly declining or hooked*; a few intermediate in size. L. mostly 5-nate-pedate; fairly many 3-4-nate. Lts. flat, subcoriaceous, *opaque* strigose-glabrous above, pale green *shining and thinly hairy beneath*; occasionally somewhat lobate in the upper half, with the ordinary teeth finely pointed and often nearly simple; term. rather broadly ovate or obovate, *with long acuminate point, cordate or subcordate base, and stalk more than $\frac{1}{3}$ its length*. Pan. *very lax*, with *most of the ped. corymbosely aggregated* in distant strongly ascending branches: *ultra-axillary top corymbose*, long or moderate; rach. and ped. with patent moderately long hairs, some felt above, crowded unequal stkd. gl (chiefly sunken), many acic. and slender declining or somewhat falcate prk. Sep. dark with pale margin, strongly ascending in young frt., mostly patent later. Pet. rather small, obovate, pinkish. Stam. far exceeding sty. Young carp. hairy. Frt. well formed, round, acid.

Set. No. 101. Woods and thickets. Local. Only known with certainty in parts of Herefordshire, Worcestershire and Breconshire. An allied form in the counties of Somerset and Carnarvon.

?Germany.

In many respects intermediate between *R. viridis* and *R. Lintoni*, but keeping distinct from both. (See *Journ. Bot.* 1893, 14 and 45.) Possibly better placed among the *Sub-Bellardiani*.

94. *R. saxicola* P. J. Muell. in *Pollich.* xvi. 202 (1859); not of Babinet. 'St. angular, nearly glabrous. L. mostly 5-nate. Lts. with short soft hairs beneath, shining, especially on the nerves; term. broadly ovate, pointed. Inflorescence often elongated, lax; branches often with aggregated ped., densely patent-hairy, furnished with crowded glands, bristles and acic. Sep. patent in frt. Pet. narrow, white.' Focke in *Koch Syn.* ed. 3.

Not in Set. As to possible British distribution see next paragraph.

Germany.

I feel no better able now than I was in 1893 (see *Journ. Bot.* for that year, p. 5, and *B. E. C. Rep.* p. 411), to write at all confidently of this species or to say positively whether it is British or not. The British plants from Oxon, Berks, Sussex and two or three western counties for which Dr. Focke has suggested this name may generally be distinguished from *R. viridis* by st. polished subglabrous yellowish-brown, lts. obovate with shorter point, pan. with broader top and much shorter lower

branches giving it a cylindrical instead of a pyramidal outline. As compared with *R. hirtus* their st.-prk. are stout and short and the stkd gl. on pan.-rach. much shorter and chiefly sunken.

A nearly allied but stouter and much more strongly armed form (with longer stkd. gl. and some glandtipped bristles on pan.) found by the Rev. A. Ley in the counties of Brecon and Glamorgan has been named *R. horridicaulis* P. J. Muell. by Dr. Focke, who however considers it 'not essentially different from *R. saxiculus*'.

95. *R. tereticaulis* P. J. Muell. in *Flora* xli. 173 (1858). *B. E. C. Rep.* 1888, 212. *E. B. ed. 3, Supp.* p. 113. *St. roundish, with dense patent hair and crowded, sunken, unequal small acic. and stkd. gl.* *L. 3-5-nate.* *Lts. coriaceous, thinly strigose above, paler and softly hairy beneath, with nearly simple shallow teeth; term. obovate-acuminate, with rather long point, narrow emarginate base, and stalk less than $\frac{1}{3}$ its length; petiole and petiolules densely clothed with hair stkd. gl. and acicular prk.* *Stip. filiform.* *Pan. in the typical plant small racemose or subracemose, in the Norfolk plant often stronger with 3-5-flowered cymose-umbellate middle branches; rach. rather flexuose and ped. often divaricate, both densely felted and hairy, with small declining prk. and crowded unequal sunken blackish stkd. gl.; longer stkd. gl. and glandtipped bristles few or none; simple l. often several, with stkd. gl. at base and densely glandular petioles. Frt.-sep. varying from loosely reflexed to erect. Stam. about equalling sty. Carp. glabrous.*

Set. No. 103. As yet found nowhere in the British Isles except in wood and on heathland near Sprowston, E. Norfolk, where it occurs in considerable quantity.

Germany and ?France.

Seems just intermediate between *R. foliosus* and *R. hirtus* var. *rotundifolius* except in being more hairy than either and usually much smaller. But such knowledge of the sp. as I have, being derived exclusively from a large series of dried Norfolk spns., is necessarily very imperfect.

b. Frt.-sep. reflexed in fl. and frt.

96. *R. ochrodermis* A. Ley in *Journ. Bot.* 1893, 15. *St. stout, very bluntly angled, striate, subglabrous, ochreous, becoming fuscous in exposure. Prk. crowded, mostly short and stout-based, declining, passing into numerous unequal prklets, acic. stkd. gl. and minute tubercles, most of the prklets and acic. being usually eglandular. L. mostly 3-nate, very rarely 5-nate-pedate. Lts. subequal, strigose above, paler and rather thinly hairy with prominent veins beneath; teeth nearly simple except near point of It.; term. It. roundish-obovate-mucronate, with entire or slightly emarginate base, and stalk more than $\frac{1}{3}$ its length. Stip. linear-lanceolate. Pan. elongate, irregularly racemose or subracemose above, with racemose or subracemose branches below; most of the branches and ped. strongly ascending with many simple and 3-fid bracts at their base; rach. and ped. felted, with short hairs, crowded, mostly sunken stkd. gl. and slender declining prk. and acic. Sep. externally greenish, conspicuously white-felted within, reflexed in fl. and frt. Pet. narrow, small, white or pinkish. Stam. at last red-based, exceeding sty. Carp. glabrous or thinly hairy.*

Set. No. 104. Woods and rough open ground. Fairly abundant locally in 5 S. England and 2 Welsh counties. Endemic?

A remarkable plant. In l. and pan. somewhat recalling *R. mucronatus*, but very different in armature and st. In some respects intermediate between that sp. and *R. foliosus*, but more nearly Koehlerian than either.

c. Sep. clasping and almost hiding frt.

97. *R. velatus* Lefv. ex. Genevier in *Mém. Soc. Acad. M. & L.* xxviii. 32 (1872). *Journ. Bot.* 1894, 49; 1896, 222. St. roundish or very bluntly angled, with unequally scattered long silky hairs and many unequal prklets acic. stkd. gl. and minute tubercles, sometimes subglabrescent, yellowish-brown or fuscous. Larger prk. very stout-based, mostly declining but on strong st. partly falcate, partly hooked. *L.* 3-5-nate-pedate. *Lts.* strigose above, with short shining hairs beneath and fairly even crenate-serrate teeth; term. roundish-ovate, with long or moderate gradually acuminate point, cordate or subcordate base, and stalk about $\frac{1}{4}$ its length; *lat.* (in 3-nate l.) with exceptionally deep gibbous lower side; bas. (in 5-nate l.) very shortly stalked. *Stip.* filiform. *Pan.* usually long cylindrical, lax below, with rounded subracemose-corymbose top, cymose-corymbose middle branches and racemose lower ones; the somewhat flexuose rach., and spreading ped. with dense hairs, declining acicular prk. and very crowded unequal chiefly short stkd. gl. *Cal.* less deeply cleft than usual, with greenish attenuate 'sep.' clasping the small frt. *Pet.* narrow, rather small, white. *Stam.* exceeding pinkish sty. *Young carp.* pubescent.

Set, No. 130. Woods in a few English and Welsh counties, especially in several parts of Herefordshire.

V.C. in England and Wales 5 [1].

France.

The name rests on Prof. Babington's authority. An interesting plant somewhat intermediate between *Bellardiani* and *Cæsii*, its most conspicuous feature being furnished by the long sep. completely embracing the small frt.

GROUP XIV. CÆSII (*Corylifolii* Focke). See pp. 6, 19.

SECT. I. L. 5-nate or 3-4-nate. Stip. linear-lanceolate or filiform (rather broadly lanceolate in *R. Balfourianus*). Drupelets fairly many, rather large, mostly epruinoise.

98. *R. dumetorum* Weihe (sp. collect.) in *Boenn. Prodr. Fl. Monast.* p. 153 (1824). Wh. & N. *Rub. Germ.* 98. *Journ. Bot.* 1870, 149, 169. St. usually angled above, somewhat hairy, glaucous, with many (often very crowded) unequal, mostly straight prk. acic. (partly glandtipped) and stkd. gl. L. 5-nate-pedate or 3-5-nate. Lts. usually thick and soft beneath with dense hair or felt, broad, acuminate or cuspidate-acuminate, mostly imbricate; term. usually with cordate or subcordate base, and only moderate point; bas. subsessile. Stip. usually narrow, rarely rather broad. Pan. compound; rach. felted and hairy, strongly armed like st. Sep. usually somewhat erect in frt., though sometimes only subpatent or loosely reflexed ultimately. Pet. large, roundish, hardly clawed, usually overlapping. Stam. usually exceeding sty. Carp. glabrous. Frt. partly imperfect, consisting of rather few large epruinoise drupelets. Comes early into flower.

Represented in Set by some of the forms described below as vars.

Chiefly in hedges and on waste ground at rather low altitudes. Very variable and very widely distributed in the British Isles, especially in stiff soils.

V.C. in G. Britain (excl. vars. following) 19. Irish Co. 7. C.I.!

Throughout the greater part of Europe except extreme N. and S.

Though in some respects recalling sp. of *Koehleriani* and *Bellardiani*, all the forms of *R. dumetorum* are separated from those groups by the more overlapping lts. subsessile bas. lts. large roundish pet. rather large

drupelets and generally by a somewhat Cæsian aspect. From other *Cæsii* they may be distinguished by the far more glandular and aciculate st. and pan.-rach., and further to some extent by the more regular and more compound pan.; but many of the forms described below are connected by intermediates, while the hybrids are numerous and at times sufficiently bewildering. Cf. Focke, *Syn. R. G.* 396.

R. dumetorum forms.

I. Frt.-sep. partly erect. Stkd. gl. on pan. considerably unequal, partly exceeding hairs.

(1) Acic. and stkd. gl. abundant.

a. Var. *ferox* Weihe in *Boenn. Prodr. Fl. Monast.* 153 (1824). *St. sub-glabrous*, very stout. *Prk.* very crowded, considerably unequal but mostly long, *nearly all straight and short-based*; some of the larger acic. glandtipped; stkd. gl. and smaller acic. very unequal, fairly abundant. *L.* chiefly 5-nate. *Lts.* very soft, often greenish-felted beneath, with finely pointed compound rather shallow teeth; *term.* *roundish-cuspidate-acuminate*, with obovate tendency, emarginate or subcordate base, and stalk long enough to prevent overlapping with interm. *Lts.*; interm. and bas. decidedly overlapping. *Stip.* *lanceolate*, very moderately broadened. Pan. often contracted into a closely branched, rather broad rounded top; *rach.* and *ped.* felted above, *very strongly armed like st.* Sep. ovate, usually contracted suddenly into long point, greenish-felted, with pale margin, usually erect in frt. Pet. roundish, with very short claw, overlapping, pink or white.

Set, No. 49. Very widely distributed, though rare in many good bramble neighbourhoods.

V. C. in G. Britain 32. Guernsey! Jersey! Sark!

Brittany! Normandy! Through a great part of Europe.

Recalling *R. Koehleri* in armature, but readily distinguished from it by the Cæsian l. pet. and frt.

b. Var. *britannicus* (Rogers) in *Journ. Bot.* 1894, 49. Near var. *ferox*, but differing in the following particulars:—*St.* usually much weaker and *rather considerably hairy*. *Prk.* shorter and weaker, mostly declining, *partly somewhat falcate*, when stout large-based. *L.* chiefly 3-nate, with lat. *Lts.* gibbous or deeply lobed, a few 5-nate. *Lts.* usually thinner, felted beneath only in very sunny spots, with more deeply incised and often much coarser toothing; *term.* *roundish-ovate* or *ovate*, with *cordate base and gradually acuminate point*. *Stip.* *filiform*. *Pan.* *much more interrupted*, with *rach.* more wavy and top *truncate*, with close-placed 1-3-flowered branches; *lower branches* very distant, rigid, compound, *like small secondary pan.*; *prk. on rach.* and *ped.* very slender, *often somewhat curved*. *Sep.* *gradually attenuate*, subpatent, or partially erect in frt. *Pet.* *broadly oval*, usually not contiguous, apparently always white.

Set, No. 105. In woods and wood borders as well as in more sunny places. Widely though somewhat locally distributed.

V. C. in G. Britain 12. Endemic?

In l. and general aspect more Cæsian (except in very luxuriant spns.) than either var. *ferox* or var. *diversifolius*; but on the other hand distinctly more Bellardian in *filiform* *stip.* rather narrower pet. and somewhat longer glandtipped organs on pan.; features which seem to remain constant even in the strongest forms of this var. Warren's var. *intensus* (*Journ. Bot.* 1870, 154, 175) seems to cover both *ferox* and *britannicus*.

c. Var. *diversifolius* (Lindl.) in *Syn. Brit. Fl.* ed. 1, 93 (1829); not of Tineo. *R. myriacanthus* Focke. *St.* strong, blunt-angled, *with much*

short hair and fewer intermediate arms. *Prk.* very unequal, stout-based; larger ones very strong, slightly declining; smaller ones fewer; short stout prklets many, passing into mere tubercles. *L.* 5-nate-pedate. *Lts.* as a rule conspicuously imbricate, dark green and wrinkled above, paler, softly hairy or felted beneath; *term.* oval or slightly obovate, with cuspidate-acuminate point, cordate or subcordate base, and rather short stalk. *Stip.* lanceolate, moderately broad. *Pan.* 'long, leafy nearly to the top, with very short axillary few-flowered subracemose branches' (Babington); *top* very narrow, close-branched; *rach.* armed like st. *Sep.* ashy-grey, with rather close felt, in frt. at first erect, ultimately reflexed. *Pet.* white.

Not in Set. Very widely distributed in England and Wales. Mid-Perth. E. Ross.

V.C. in G. Britain 55. Irish Co. 5. Sark!

N.-W. Germany (*R. myriacanthus* Focke).

Usually distinguishable with ease from vars. *ferox* and *britannicus* by the greater interval between the strong prk. and other arms on both st. and pan., the conspicuously imbricate and comparatively narrow lts. and long narrow leafy pan.

d. Var. *pilosus* Wh. & N. in *Rub. Germ.* 99 (1822). *St. and pan.-rach.*, with patent hairs, many rather weak declining prk., and rather short acic. and stkd. gl. Lts. mostly imbricate. Stip. linear-lanceolate. *Pan.* leafy nearly to top, cylindrical, with long-peduncled 1-2-flowered branches above; lower branches distant, often long. Sep. greyish-green, shaggy, with rather paler margin and long point, erect on fall of pet. Pet white, (sometimes) pinkish in bud.

Not in Set. Imperfectly known. Distribution uncertain.

V.C. in England and Wales 7.

Germany.

A soft hairy form which may keep distinct from others, but needs further study. With us the hairiness of st. is chiefly conspicuous in the early summer. Usually the lts. are (as described in *Rub. Germ.* 99) ovoid-subrotund; but they are sometimes narrower.

(2) Stkd. gl. many, chiefly rather short; very crowded on pan. Acic. and prklets comparatively few.

e. Var. *rubriflorus* (Purchas) in *Journ. Bot.* 1894, 139 and 187. St. usually weak and conspicuously glaucous, only thinly hairy. *Prk.* chiefly on the blunt angles of st., comparatively small and not very unequal. Stkd. gl. many, acic. and prklets few. L. mostly 5-nate. Lts. rather thin, usually imbricate. Stip. narrow, linear-lanceolate. *Pan.* leafy nearly to the top, straggling irregularly, with one or more of the upper branches divaricate and many-flowered; ped. long, divaricate; *rach.* wavy, with short hair, densely clothed with very unequal but mostly short stkd. gl.; prk. chiefly declining, a few falcate. Sep. as in var. *pilosus*. *Pet.* obovate, narrow for this sp., deep purplish pink. Stam. pink, exceeding red sty.

Set. No. 131. Hedges. Widely spread and locally abundant in S.-W., Mid. and E. Derbyshire. As yet unknown elsewhere.

Like var. *pilosus* in l. and prk., but with much shorter hair and a very different pan.

(3) Acic. and stkd. gl. comparatively few.

f. Var. *tuberculatus* (Bab.) in *Fl. Camb.* 306 (1860). *R. scabrosus* Bab. (not of P. J. Muell.). St. stout. *Prk.* and prklets with stout cushion-like bases; acic. and stkd. gl. few and inconspicuous. L. 3-5-nate-pedate. *Term.* lt. roundish-oval with rather short point. *Stip.* lanceolate.

Pan. open cylindrical, with corymbose ultra-axillary top and fairly long corymbose or subracemose branches; *rach.* felted, with short hair and stout unequal *prk.* but few acic. or stkd. gl. and those mostly short. *Sep.* with short close felt, usually somewhat erect in frt. *Pet.* rather deep pink or rose. *Drupelets* rather many and small.

Not in Set. Apparently widespread but variable.

V.C. in G. Britain 37. Irish Co. 4 [2]. Jersey!

A difficult form, to which hybrids derived from *R. corylifolius* and *R. rusticus* have often been assigned. Much less glandular than all the preceding forms and (together with the two that follow) nearer to *R. corylifolius*.

g. Var. *concinus* Warren in *Journ. Bot.* 1870, 153; not of Focke. St. rather slender, thinly hairy, with scattered, unequal *patent* and *sub-patent* broad-based *prk.* and acic.; *stkd. gl.* and minute acic. few. L. 3-5-nate; chiefly 3-nate with lat. lts. gibbous and lobed below. Lts. small and neat, dark green above, much paler beneath, and often greenish-grey felted, with sharp teeth; *term. roundish*, with short *cuspidate-acuminate point*, and *stalk* nearly $\frac{1}{2}$ its length. *Stip.* narrow, linear-lanceolate. *Pan.* elongate, with narrow subracemose or fasciculate ultra-axillary top and long distant lower racemose branches; *rach.* felted, with short hair and a good many unequally scattered, short stkd. gl. and acic.; *prk.* fairly long, subpatent, and (a few) falcate. *Sep.* patent or loosely reflexed in frt. *Pet.* rather small, pinkish.

Set, No. 132. Locally abundant in N. England. Rarer in Midlands and further south.

V.C. in England 8. Endemic?

Usually an exceedingly well-marked form.

II. Frt.-sep. reflexed. Stkd. gl. on pan. short, sunken.

h. Var. *fasciculatus* (P. J. Muell.) in *Flora* xli. 182 (1858), *R. corylifolius* var. *purpureus* Bab. formerly. I know very little of this as a living plant. In Warwickshire spns. of Mr. J. E. Bagnall's collecting and the Rev. A. Ley's from Herefordshire the most marked features seem to be:— *St. dark purple*, glabrescent (with stellate down at first), with *thinly scattered small prklets* and *rather minute acic.* and *stkd. gl.* L. mostly 5-nate. Lts. imbricate, with grey or greyish-green felt beneath and *large incised compound teeth*. *Pan.* narrow, with short ultra-axillary top; *rach.* with *dense patent hairs* hiding the many *subsessile* and *short stkd. gl.* *Sep.* reflexed in frt.

Set, No. 50 (as var. of *R. corylifolius*). Apparently more widely distributed than var. *concinus*, though local in the south.

V.C. in G. Britain 16 [5]. Irish Co. [3].

Continental distribution uncertain.

Seems too glandular and aciculate for close alliance with *R. corylifolius*, though in some respects (especially in the reflexed frt.-sep.) diverging towards that sp. from *R. dumetorum*. Latterly considered by Prof. Babington (*Journ. Bot.* 1886, 235) to be identical with Mueller's continental spns. of his *R. fasciculatus*, which I have not seen.

Other undescribed forms of this aggregate no doubt exist in G. Britain, and a further study of these may possibly justify the addition of one or more new vars. to the preceding list.

99. *R. corylifolius* Sm. in *Fl. Brit.* ii. 542 (1800) (sp. collect); not of Besser, De Candolle or Hayne. St. roundish, glabrous or subglabrous, glaucous, reddish; *stkd. gl.* and *acic.* very few or none. *Prk. subulate* and *subequal*, irregularly scattered, patent or slightly declining. L. mostly 5-nate-pedate, sometimes 6-7-nate, often large. Lts. coriaceous,

ashy-felted or somewhat greenish-felted beneath, usu ally imbricate; *term.* with cordate or subcordate base and *fairly long stalk*, otherwise variable; bas. sessile or very nearly so. *Stip.* lanceolate. *Pan.* somewhat *irregular*, usually corymbose above, often with 2 or 3 long axillary branches; *rach. ped.* and *sep.* with whitish felt and often a few sessile or subsessile glands; *ordinary stkd. gl.* and *acic.* *very few or none.* *Sep.* *normally reflexed in frt.* *Pet.* roundish-ovate, white or pinkish. *Stam.* usually exceeding *sty.*, though as a rule only slightly. *Carp.* glabrous, *Frt.* of rather many moderately sized drupelets.

Set. No. 106. (Fasc. iv.), var. *sublustris*. Hedges and commons. Very widely though somewhat locally distributed, and usually very abundant where it occurs.

V.C. in G. Britain 89. Irish Co. 15. C.I.!

'Nearly allied variable forms occur on the Continent' (Focke).

In most cases readily distinguishable from all the forms of *R. dumetorum* and *R. Balfourianus* by the almost total absence of stkd. gl. on st. and pan.-rach., the nearly close whitish felt on rach. ped. and sep., and the normally reflexed frt.-sep.; and from *dumetorum* forms especially by the less mixed armature.

a. Var. *sublustris* (Lees) in *Steele*, p. 54 (1847). St. usually quite round. Prk. slender, very scattered. L. 5-7-nate. Lts. sharply incised-serrate; *term.* often lobate at the shoulder towards the gradually acuminate point, or deeply cleft (on one side or both) at the base.

Set. No. 106 (Fasc. iv.). Common.

V.C. in G. Britain 61. Irish Co. 11. Jersey!

The *R. sublustris* of Lees, as described above, is a very strongly marked and easily recognised bramble; but intermediates connecting it with the next var. are frequent. This fairly represents *R. corylifolius* as described by Smith in *Fl. Brit.*, 542.

b. Var. *cyclophyllus* (Lindb.). Var. *conjungens* Bab. (formerly). St. rather more angular, often stout. Prk. rather shorter and with stouter base. L. 5-nate. Lts. rounder and more conspicuously imbricate, with somewhat crenate-serrate teeth; *term.* not lobate, with shorter more cuspidate point.

Not in Set. Quite as common as var. *sublustris*, but more variable.

V.C. in G. Britain 48 [1]. Irish Co. 6. Guernsey! Jersey!

Scandinavia and probably in other parts of W. Europe.

This var. shows some approximation towards *R. dumetorum*, while differing from it conspicuously in being nearly eglandular, with whitish-felted rach. ped. and sep. and reflexed frt.-sep.

100. **R. Balfourianus** Blox. ex Babington in *Ann. Nat. Hist.*, Ser. I. xix. 86 (1847). *R. ciliatus* Lindb. (in part). *R. divergens* Neum. See Aresch. *Some Obs.*, 60, 61. St. bluntly angled, with many fine silky hairs and usually a few small acic. short stkd. gl. and some glaucous bloom. Prk. rather small and slender, nearly patent, irregularly scattered. L. mostly 5-nate. Lts. imbricate at first, *large*, usually thin, wrinkled and strigose above, soft and greenish-felted beneath when young, but bare-looking with short thin hair at last, irregularly toothed, sometimes lobate towards the point; *term.* variable, usually with gradually acuminate point, somewhat cordate base, and rather long stalk. *Stip.* rather broadly lanceolate. *Pan.* loose, diffuse, with long erect-patent few-flowered branches; *rach.* flexuose, felted or hairy above, with very unequally scattered short stkd. gl.; acic. and slender straight prk. few. *Fl.* usually very large, rosacean. *Sep.* attenuate, hairy and glandular, soon erect in frt. *Pet.* round, purplish lilac or white. *Stam.* short, often only equalling the flesh-coloured *sty.* *Frt.* handsome, obovate, richly flavoured. *Carp.* glabrous or nearly so.

Set. No. 75. Hedges and thickets. Local, but very widely distributed. V.C. in G. Britain 38 [8]. Irish Co. 6. Sark! Jersey! Brittany! and apparently elsewhere in W. Europe.

When typical a distinct and strikingly handsome plant with its exceptionally large l. fl. and frt., its wide irregular pan. prominent flesh-coloured sty. and conspicuous clasping frt.-sep.; but there are undoubtedly intermediate forms connecting it with *R. corylifolius*, and these are often most baffling to the student even with the living bush before him. One of the most distinct-looking of these,—a remarkably hairy and nearly eglandular W. Gloucestershire form with long cylindrical pan. and handsome white fl.,—has been described in *Journ. Bot.* 1899, 389, by Mr. J. W. White under the name *R. Bucknallii* sp. nov. Of the two plants constituting No. 78 of the Set, Mr. Bagnall's (from Kingswood) is much the more typical, the Chard Common plant issued to some of the subscribers being exceptionally glandular.

SECT. II. L. normally 3-nate. Stip. considerably broadened in middle. Drupelets few, very large, conspicuously glaucous.

101. *R. cæsius* Linn. in *Sp. Pl.* 493 (1753). St. ultimately prostrate from low arch, often erect till midsummer, much branched and rooting abundantly, round, usually *very glaucous* slender glabrous and nearly or quite eglandular, though sometimes with scattered stkd. gl. and acic. Prk. always *weak and short*, subulate, usually straight but not very unfrequently falcate or even hooked. L. almost always 3-nate. Lts. thin (except in very sunny places), strigose above, paler and thinly hairy beneath, *irregularly incised-lobate*; term. very variable, usually broadly ovate with triangular-acuminate point and somewhat cordate base; lat. bilobed, sometimes divided to the base. Stip. usually *very wide in the middle and tapering at both ends*. Pan. lax, often racemose above and somewhat fasciculate, with few long-pedicelled fl.; lower branches ascending, 2-3-flowered; rach. and ped. usually slender, with close felt, armed like the st. Sep. greenish-felted, often glandular, *with long points clasping the few large glaucous acid drupelets*. Pet. roundish, white. Stam. and sty. about equal.

Set. No. 133. Distributed widely through the British Isles, but found chiefly on calcareous and clayey soils and in damp places.

V.C. in G. Britain 71. Irish Co. 13. Guernsey! Jersey!

Normandy! Through the greater part of Europe into N.-W. Asia.

Exceedingly variable; hybridising freely with other cæsians and with *R. idæus* and *R. rusticanus*. Some of the hybrids approach *R. Balfourianus*, but are smaller as well as more glabrous and more glaucous. I find myself quite unable to give reliable definitions of the supposed vars.

SECTION B. HERBACEI.

St. herbaceous or subherbaceous. Stip. attached to st. only or to st. and petiole. Fl. terminal:—solitary or in a subumbellate corymb. Receptacle flat.

SUBGENUS *CYLACTIS* Rafin. (*Rubi Saxatiles* Bab.).

St. subherbaceous, often rooting at the tip. Fl. hermaphrodite, in a subumbellate corymb. Carp. usually free. *Stone bramble*.

102. *Rubus saxatilis* Linn. in *Sp. Pl.* 494 (1753). St. annual:—the barren one slender flagellate hairy unarmed or with scattered minute

acic. and linear stip.; the flowering one short erect simple or branched, usually aciculate, with ovate stip. *L. 3-nate.* Fl. small. Pet. erect, white, about equalling the sep. Stam. far exceeding sty. *Drupelets large, 1-6, deep red.*

Not in Set. In moist woods and rocky thickets (especially on limestone) through the hilly districts of G. Britain to Dartmoor; but rare in S. and E. England.

V.C. in G. Britain 69. Irish Co. 16.

In Mid. and N. Europe, N. Asia and S. Greenland.

SUBGENUS **CHAMÆMORUS** Focke (*Rubi Arcticæ* Bab.).

No barren st. Flowering shoot from long subterranean rhizome.

Fl. dioecious, solitary. Carp. connate. *Cloudberry.*

103. **Rubus Chamæmorus** Linn. in *Sp. Pl.* 708 (1753). *St. subterranean.* *L. simple plicate reniform 5-lobed;* the lobes blunt crenate-serrate. Stip. confined to lower part of st., broad, scale-like. Fl. large, dioecious, solitary. Pet. white. *Drupelets large, first red, then orange.*

Not in Set. Turfy mountain bogs, descending below 2000 ft. on Axe-Edge. From Caithness to Derby and Montgomery, fairly frequent.

V.C. in G. Britain 37. Irish Co. 2.

Through the mountainous parts of Europe and subarctic Asia and America.

APPENDIX

AN attempt is here made to revise and bring up to date the comital numbers showing the distribution of the several *Rubus* species, subspecies and varieties in our British list. For Great Britain the numbers adopted for the 'V.C.' (i.e. counties and vice-counties) are the same as H. C. Watson's in *Topographical Botany*; but in the case of Ireland I have thought it best to limit my record to counties, and so forgo the use of numbers to represent them.

The numbers (for G. Britain) and counties (for Ireland) enclosed in *square* brackets represent the counties or vice-counties for which, in the case of the plant under consideration, confirmatory evidence seems desirable as to its occurrence in such county or vice-county. This confirmatory evidence is especially desirable for all early records of suberect forms and of such other species as were widely misunderstood by us prior to Dr. Focke's visits to this country in 1889 and 1894, e.g. *R. carpinifolius*, *R. villicaulis* and *R. thyrsoideus*.

The numbers or names of counties enclosed in *rounded* brackets (coming between the unbracketed and the square-bracketed) are those recorded on what seems reliable authority; in addition to the unbracketed, for which alone I can personally vouch. These distinctions are however dispensed with, and all published records known to me accepted, in dealing with the six well-known species, *R. idaeus*, *R. rusticanus*, *R. coryli-folius*, *R. cæsius*, *R. saxatilis* and *R. Chamæmorus*.

Detailed localities and authorities are added for a few of the rarest forms.

G.B. stands for Great Britain, E. for England, S. for Scotland, W. for Wales, I. for Ireland, and C.I. for Channel Islands.

1. ***Rubus idæus* Linn.** G.B. 110 (all except 1 and 45). I. 'throughout Ireland.' *Cyb. Hib.* ed. 2, 99.

Var. *obtusifolius* (Willd.). G.B. 18:—4, 5, 9, 15, 16, 21, 22, 36, 38, 49, 57, 72, 86 (23, 58, 69, 85, 88).

2. ***R. fissus* Lindl.** G.B. 45 [9]:—3, 4, 6, 9, 11, 14-16, 18, 22, 23, 34, 35, 38-40, 42-44, 49, 52, 55, 57-60, 63, 64, 66, 69, 70, 77, 86-88, 90, 91, 97, 105, 106, 111 (47, 48, 62, 96). [46, 50, 54, 72, 73, 89, 92, 98, 99.] I. 4:—Cork, Westm., Down, Derry.

3. ***R. suberectus* Anders.** G.B. 40 [19]:—2-9, 11, 14, 17, 22, 35, 36, 41-44, 46, 48-50, 53, 55, 56, 58, 69, 86-88, 96-98, 101, 105 (34, 38, 40, 47, 73). [10, 12, 15, 20, 37, 39, 54, 57, 63-65, 70, 72, 74, 76, 81, 89, 90, 92.] I. 1 [4]:—Westm. [Cork, Galw., Doneg., Derry].

4. ***R. Rogersii* Linton.** G.B. 16 [1]:—3, 5, 16, 24, 27, 40, 42, 57, 67, 86-88, 91, 95, 96, 106. [8.] I. 2:—Down, Derry.

5. ***R. sulcatus* Vest.** G.B. 6 [4]:—4, 6, 9, 22, 36, 43. [3, 69, 70, 89.]

6. ***R. plicatus* Wh. & N.** G.B. 55 [17]:—2-6, 8-12, 14, 16, 17, 21-24, 34, 36, 38-40, 42-44, 48, 49, 52, 55, 57-59, 62, 63, 70, 86-88, 92, 96-99, 103-105, 107 (25-

28, 35, 41, 46, 47, 102, 106). [13, 18, 20, 64, 65, 67-69, 72, 74, 77, 81, 89-91, 100, 102.] I. 6 [2]:—Cork, Galw., Mayo, Arm., Tyr., Down [Meath, Derry].

Var. *Bertramii* G. Braun. G.B. 11:—5, 14, 17, 35, 42, 44, 48 (34, 36, 43, 46).

Var. *hemistemon* (P. J. Muell.). G.B. 9 [5]:—14, 17, 27, 42, 48, 86, 106, 109. [6, 10, 59, 88, 89.] I. 1 [1]:—Galw. [Ferman].

7. *R. nitidus* Wh. & N. G.B. 20 [4]:—3, 4, 6, 9, 11, 17, 22, 24, 34, 36, 42, 43, 48, 49, 52, 58, 97 (2, 8, 25). [14, 35, 55, 88.] I. [2]:—Leitr., Down].

Subsp. *opacus* Focke. E. 5 [S. 1]:—3, 6, 9, 15, 35. [S. 107.] I. 1:—Westm.

8. *R. affinis* Wh. & N. G.B. 15 [6]:—3-6, 9-11, 14, 16, 17, 22, 27, 34, 36, 52. [15, 25, 49, 87-89.] I. [1]:—Kerry].

Var. *Briggsianus* Rogers. E. & W. 7:—2-5, 9, 45, 52. C.I.:—Guerns., Jers.

9. *R. integrabasis* P. J. Muell.? E. 5 [2]:—3, 4, 9, 11, 58. [6, 17.]

10. *R. cariensis* Genev. E. & W. 8:—4, 5, 9, 41, 42, 44, 46, 49. I. 1:—Wexf.

11. *R. holerythros* Focke. E. 5:—3, 13, 14, 17, 22.

12. *R. latifolius* Bab. G.B. 8:—24, 52, 88 (35, 83, 84, 89, 97).

13. *R. imbricatus* Hort. E. & W. 13 [2]:—2-5, 9, 14, 16, 17, 22, 34-36 (11). [88, 89.]

14. *R. carpinifolius* Wh. & N. G.B. 32 [5]:—3, 6, 8, 9, 11-14, 16, 17, 21, 22, 34-40, 42, 43, 55, 57, 62, 63, 97, 98, 103, 105. [5, 10, 15, 88, 89.] I. 2 [5]:—(Dubl. Westm.). [Kerry, Galw., Doneg., Antr., Down.]

15. *R. incurvatus* Bab. G.B. 32:—2, 4, 9, 16, 17, 22, 36, 39, 40, 42, 43, 46, 48-52, 57, 59, 60, 74, 88, 105 (13, 45, 58, 69-71, 76, 89, 110). I. 3:—Wexf., Galw., Westm. [C.I.:—Jersey.]

16. *R. Lindleianus* Lees. G.B. 74:—2-5, 7-13, 15-18, 20-24, 26, 32, 34-36, 38-44, 46, 48-50, 53-65, 86-90, 97, 99, 101 (6, 25, 27, 28, 31, 37, 45, 51, 52, 66, 69-72, 74, 76, 100). I. 8:—Galw., Mayo, Arm., Down, Antr. (Kilk., Westm., Derry).

17. *R. erythrinus* Genev. E. & W. 26:—2-7, 9, 11, 12, 14, 16, 17, 22, 34-38, 40-42, 44, 46, 57, 60 (49). I. 3:—Westm., Galw., Derry.

18. *R. durescens* W. R. Linton. E. 1:—*Mid-Derby*, from near Ashbourne to Ambergate and Duffield, *W. R. Linton!*

19. *R. rhamnifolius* Wh. & N. G.B. 69:—1-5, 7-14, 16-18, 21-24, 27, 32-34, 36-42, 48-52, 55-58, 68, 70, 85-87 (6, 15, 19, 25, 26, 28, 35, 44, 46, 54, 62-64, 69, 71, 73, 74, 88, 89, 92, 95, 98). I. 8:—Dubl., Meath, Galw., Arm., Down, Antr. (Wexf., Westm.). C.I.:—Guerns.

Subsp. *Bakeri* F. A. Lees. G.B. 13:—16, 17, 38, 46, 62, 64, 65, 86, 98, 101 (36, 58, 59). I. 1:—Galw.

20. *R. nemoralis* P. J. Muell. G.B. 7:—1, 8, 9, 11, 36, 87 (62). I. [1]:—Down].

Var. *glabratus* Bab. G.B. 8 [1]:—36, 49, 86 (23, 34, 38, 46, 48). [58.]

Var. *Silurum* A. Ley. E. & W. 11:—34, 36, 42, 43, 46, 48, 60 (41, 44, 47, 49).

21. *R. Scheutzii* Lindeb. G.B. 11:—12, 49, 52, 60, 74, 86-88, 96, 97, 99.

22. *R. dumnoniensis* Bab. G.B. 28 [2]:—2-5, 9, 11-15, 22-24, 34, 36, 42, 44, 46, 49, 52, 57, 58, 97, 98, 101, 106 (1, 6). [16, 17.] I. 3 [1]:—Kilk., Galw., Mayo [Down].

23. *R. pulcherrimus* Neum. G.B. 71:—2-4, 7-18, 20-24, 26, 30, 34-36, 38-40, 42-44, 46, 48-52, 54-58, 60-63, 65, 67-71, 73, 74, 87, 88, 97-101, 103-105, 110 (5, 6, 25, 27, 28, 41). I. 8 [1]:—Wickl., Dubl., Meath, Westm., Galw., Arm., Down, Antr. [Cork]. C.I.:—Guerns., Jers.

24. *R. Lindebergii* P. J. Muell. G.B. 21:—13, 34-36, 39, 40, 42, 43, 55, 57, 58, 60, 62-65, 67, 70, 85, 87, 88.

25. *R. mercicus* Bagnall. E. 1:—38, Warw. Lane from Water Orton to Minworth, locally abundant, *J. E. Bagnall!*
Var. *bracteatus* Bagnall. E. 8 [1]:—14, 21, 22, 36, 38, 59, 60, 69. [58.]
Var. *chrysoxylon* Rogers. W. 2:—49 and 52. 49. *Carnarv.*: Bangor neighbourhood, abundant, *J. E. Griffith!* 52, *Angl.*: between Bethel and Bodorgan Road R. Station, *J. E. Griffith!*

26. *R. villicaulis* Koehl. G.B. 25 [3]:—2-4, 6, 9, 39, 42, 43, 49, 52, 72, 84, 86-88, 95-98, 100, 104, 106-108, 110 (17). [54, 70, 89.] I. 1 [8]:—Arm. [Kerry, Waterf., Meath, Clare, Galw., Leitr., Antr., Derry].
Subsp. *Selmeri* (Lindeb.). G.B. 55 [6]:—2-9, 11, 12, 16, 18, 21-23, 27, 32, 35, 36, 38-40, 42, 43, 46, 48-52, 55-60, 62, 63, 67-70, 74, 84, 86-89, 96-101, 103, 105 (41, 44, 47). [33, 64, 65, 77, 95, 106.] I. 7 [1]:—Galw., Mayo, Arm., Doneg., Down, Antr., Derry [Cavan].
Subsp. *calvatus* Blox. E. 10 [1]:—14, 17, 22, 39, 40, 55, 57-59 (38). [24.] I. [1]:—Doneg.].
Subsp. *rhombifolius* Weihe. G.B. 15 [2]:—11, 12, 17, 18, 22, 32, 35, 36, 49, 56, 57, 87 (5, 6, 38). [88, 110.] I. 2:—Westm., Mayo. C.I.:—Guernsey.

27. *R. gratus* Focke. G.B. 27 [1]:—2, 3, 5, 6, 16, 17, 24, 27, 34, 36, 38-42, 53, 54, 56, 57, 60, 87, 99, 104, 110 (15, 44, 48). [88.] I. 1 [1]:—Arm. [Antr.].

28. *R. leucandrus* Focke. E. & W. 9 [1]:—2, 3, 5, 9, 11, 12, 34, 35, 42. [36.]

29. *R. ramosus* Briggs. G.B. 4 [5]:—1-3, 38. [23, 58, 70, 88, 89.]

30. *R. thyrsoides* Wimm. E. & W. 14 [5]:—3, 17, 22, 24, 32, 36, 38, 49, 52, 53, 55-58. [10-12, 29, 92.]

31. *R. argentatus* P. J. Muell. G.B. 26:—4-6, 8-10, 12-14, 16, 17, 19, 22, 24, 32, 34, 36-38, 41-44, 58, 74 (35). I. 1:—Mayo. C.I.:—Guerns., Jers.
Var. *robustus* (P. J. Muell.). E. & W. 11 [2]:—9, 11, 17, 23, 36, 42, 44, 49, 57 (16, 52). [32, 55.] C.I.:—Guerns.
Var. *clivicola* A. Ley. E. & W. 11:—1, 3, 16, 23, 24, 35-37, 42, 43, 47.

32. *R. rusticanus* Merc. G.B. 70:—1-19, 21-30, 32-46, 48-52, 54-58, 60-65, 67-71, 75, 89, 91, 100, 110. I. generally distributed. C.I.:—Guerns., Jers., Sark.

33. *R. pubescens* Weihe. E. & W. 11 [9]:—2, 6-9, 17, 22, 23, 36, 52, 56. [4, 14, 21, 24-27, 38, 49.] I. 1:—Down.
Var. *subinermis* Rogers. E. 12:—9, 11-14, 16, 17, 21, 22, 34, 36, 39.

34. *R. silvaticus* Wh. & N. E. & W. 18 [2]:—2-4, 6, 8, 9, 17, 20-22, 24, 35, 36, 40, 42, 43, 49, 63. [5, 46.] I. 2 [1]:—Wickl., Dubl. [Down].

35. *R. myricæ* Focke, var. *hesperius* Rogers. I. 2:—Mayo and Galw.,—districts to the N. and N.-E. of L. Corrib, in great quantity, *E. S. Marshall!*

36. *R. lentiginosus* Lees. E. & W. 8 [3]:—3, 22, 27, 38-40, 49, 51, 59. [14, 16, 17].

37. *R. macrophyllus* Wh. & N. G.B. 42 [16]:—2-9, 11, 14-18, 20-24, 34, 36, 38, 40, 41, 43, 49, 55, 57, 59, 62, 65, 70, 86, 87, 97, 98 (25-28, 35, 37) [10, 12, 13, 42, 45, 46, 48, 58, 68, 69, 72, 81, 88, 89, 92, 95.] I. 8 [3]:—Kerry, Cork, Queen's, Wickl., Dubl., King's, Down, Derry [Clare, Leitr., Antr.] C. I.:—Jersey.
Subsp. *Schlechtendalii* (Weihe). G.B. 38 [1]:—3, 4, 8, 9, 14, 21, 22, 27, 32, 36-38, 40-44, 48-50, 52, 55-58, 98, 106 (2, 5, 6, 10, 13, 17, 20, 25, 35, 46, 62, 84, 96). [87.] I. 8:—Cork, Wexf., Wickl., Dubl., Westm., Arm., Antr., Down.

Var. *macrophyloides* (Genev.) G.B. 6:—2, 34-36, 40, 88. C. I.:—Guerns., Sark.
Var. *amplificatus* (Lees). G.B. 20:—27, 35, 55, 57 (5, 15, 18, 22, 25, 32, 33, 37-39, 58, 62, 63, 72, 88, 100). I. 1 [2]:—Wickl. [Westm., Antr.].

38. *R. Questierii* Lefv. & Muell. E. & W. 7 [3]:—3, 9, 16, 22, 42, 44 (5). [4, 36, 46.] I. [1:—Down]. C.I. :—Jersey.

39. *R. Salteri* Bab. E. 4. G.B. [4]:—10, 36, 38, 55. [23, 26, 88, 89.] I. [3:—Mayo, Arm., Down].

40. *R. Colemanni* Blox. E. 3. G.B. [4]:—17, 22, 55. [3, 11, 58, 89.] I. [1:—Wickl.].

41. *R. Sprengelii* Weihe. G.B. 45 [1]:—3-6, 8-11, 13-18, 21-23, 34-36, 38-40, 42, 46, 48, 49, 51, 55, 57-60, 62-64, 73, 74 (2, 12, 20, 24, 27, 37, 69). [89.] I. 3:—Cork, Kilk., Wexf. C.I. :—Guerns., Jers.

42. *R. orthoclados* A. Ley. E. 1:—35 (see p. .)

43. *R. micans* Gren. & Godr. G.B. 20 [5]:—1-5, 8-10, 13, 14, 16, 17, 22, 35, 36, 42, 49 (6, 38, 39). [11, 40, 58, 88, 107.] I. 1 [1]:—Dubl. [Down]. C. I. :—Jersey.

44. *R. hirtifolius* Muell. & Wirtg. E. & W. 13 [2]:—9, 15, 34, 36, 40-43, 47-49, 96 (27). [10, 68.] I. 3 [3]:—Wexf., Galw., Down. [Kilk., Westm., Leitr.].

Var. *danicus* Focke. G.B. 17:—4, 36, 42, 55, 68, 74, 77, 86-89, 96-98, 103, 108 (49). I. 3:—Wexf., Westm., Mayo.

Var. *mollissimus* Rogers. E. & W. 8 [1]:—4, 5, 9, 17, 36, 44, 49, 55. [3.] I. 4:—Galw., Mayo, Down, Derry.

45. *R. iricus* Rogers. I. 3:—Cork, Galw., Mayo. *Cork*: At Whitegate and apparently also at Ballydehob, Skibbereen. *R. A. Phillips!* Galw. and Mayo. About Maam, Cong and Clonbur, to the E. and N. of L. Corrib: and at Mullaranny and Newport, W. Mayo; locally abundant. *E. S. Marshall!*

46. *R. pyramidalis* Kalt. G.B. 34 [3]:—3-9, 11, 12, 14, 16, 17, 18, 22, 24, 27, 30, 32, 34-44, 46, 48, 49, 55, 57, 58, 63, 67, 69, 87, 88, 96, 105. [26, 51, 89.] I. 11:—Wexf., Wickl., Kild., Dubl., Galw., Mayo, Sligo, Arm., Down, Antr. (Westm.).

Subsp. *macranthelos* Marss. E. 1:—3. *S. Dev.* : Plympton St. Mary (Wood near Hemerdon and towards Marsh Mills). Bushy flat below Cholwicktown (border of Dartmoor), *Briggs!*

47. *R. leucostachys* Schleich. G.B. 69:—1-12, 14-18, 20-23, 26, 27, 32-34, 36, 37, 39-43, 46, 48-57, 59, 60, 62, 63, 65, 69, 70, 107 (13, 19, 24, 25, 30, 31, 35, 38, 44, 45, 47, 58, 64, 67, 68, 71, 81). I. 19:—Queen's, Wexf., Wickl., Kild., Dubl., Galw., King's, Sligo, Cavan, Arm. (Kerry, Cork, Kilk., Clare, Westm., Leitr., Down, Antr., Derry). C.I. :—Guerns., Jers., Sark.

Var. *gymnostachys* (Genev.). E. & W. 8:—5, 9, 24, 36, 42, 44, 49, 51. I. [1:—Wickl.].

Subsp. *leucanthemus* P. J. Muell. ? E. & W. 6:—3, 9, 11, 17, 22, 43. I. 2:—Mayo, Galw.

48. *R. lasioclados* Focke. E. & W. 5:—15, 16, 22, 42 (49).

Var. *angustifolius* Rogers. E. & W. 20:—4, 6, 7-9, 11, 16, 17, 22, 35-37, 40-44, 46, 48 (34). I. 1:—Wexf. C.I. :—Guerns., Jers.

49. *R. criniger* Linton. E. 10 [1]:—16, 22, 23, 27, 36, 38, 39, 55, 57 (28). [58.] I. 1:—Down.

50. *R. adenanthus* Boul. & Gill. C.I. :—*Jersey*, Gorey Bay, in good quantity, 1897. *The author.*

51. *R. Boræanus* Genev. G.B. 7 [2]:—2, 3, 27, 28, 37, 49, 62. [39, 97.] I. 1:—Down. C.I. :—Guerns., Jers.

52. *R. cinerosus* Rogers. E. & W. 10 [1]:—12, 14, 16, 17, 22-24, 36, 43, 62. [68.] I. 2:—Mayo, Westm.

53. *R. mucronatus* Blox. G.B. 57 [2]:—2-6, 16, 17, 20, 21, 25, 27, 34, 36, 38, 40, 42-44, 46, 47, 49, 55, 57, 58, 62-64, 68, 84-89, 91, 96-99, 103-107, 110 (1, 22, 32, 39, 67, 69, 70, 81, 82, 92, 100, 102). [23, 54.] I. 6:—Dubl., Westm., Arm., Down, Derry (Mayo).

Var. *nudicaulis* Rogers. 3 [1]:—8, 9, 11. [10.]

54. *R. Gelertii* Frider. G.B. 4 [5]:—14, 17, 44, 106. [25, 36, 43, 55, 58.] I. 1:—Dubl.

55. *R. anglosaxonicus* Gelert. E. & W. 21 [3]:—2-6, 8, 9, 11, 13, 14, 16, 17, 19, 36, 38, 40, 56, 57 (22, 42, 49). [23, 27, 34.] I. 1:—Arm.

Subsp. *curvidens* A. Ley. E. & W. 5 [1]:—36, 37, 44, 48, 49. [40.] *vestitiformis* subsp. nov. E. 2:—34, 36, 34. *W. Glost.*: Micheldean Road, A. Ley! 36. *Heref.*: Bull's Hill, Walford; Frith Wood, Ledbury; Chase Wood, Ross; very abundant. A. Ley!

Subsp. *raduloides* Rogers. E. & W. 15:—6, 9, 16, 17, 34-37, 40, 42-44, 51, 57, 58.

Subsp. *setulosus* Rogers. E. & W. 8:—4, 5, 23, 34-36, 42, 55.

56. *R. melanoxylon* Muell. & Wirtg. G.B. 6 [3]:—36, 44, 86, 87, 95, 98. [48, 49, 57.]

57. *R. infestus* Weihe. G.B. 28 [5]:—5, 6, 9, 11, 17, 18, 22, 24, 36, 38-40, 42, 43, 49, 55, 57, 59, 60, 65, 67-69, 74, 86-88, 97. [13, 15, 58, 70, 72.] I. 2:—Dubl., Derry.

Var. *virgultorum* A. Ley. E. 4:—35-37, 40.

58. *R. uncinatus* P. J. Muell. E. 2 [1]:—34, 35. [24.] 34. *W. Glost.*: Lea Bailey, A. Ley! 35. *Monm.*: Woods above Troy House, E. F. Linton! [24. *Bucks.*: Mop End near Amersham, C. E. Britton!]

59. *R. Borreri* Bell Salt. E. & W. 12 [1]:—4-6, 8-10, 34-36, 40, 48 (3). [74.] I. 5:—Wexf., Dubl., Galw., Westm., Arm. C.I.:—Guerns., Jers.

Var. *dentatifolius* Briggs. E. 4 [1]:—2-4, 9. [22.] I. 1:—Westm. See p. 61.

60. *R. Drejeri* G. Jensen. G.B. 13:—5, 36, 40, 42, 43, 55, 57, 62, 68, 86, 87 (15, 16). I. 1 [1]:—Mayo. [Kilk.]

Subsp. *Leyanus* Rogers. E. & W. 18:—2-4, 8, 24, 34-36, 38, 39, 41, 43, 44, 49, 51 (1, 5, 42). I. 2 [1]:—Wexf., Down. [Arm.]

Subsp. *hibernicus* Rogers. I. 1:—Down. Saintfield, C. H. Waddell! Aghaderg and Lisnagade, H. W. Lett!

61. *R. radula* Weihe (type). G.B. 43 [22]:—3, 5, 12, 14, 17, 21-24, 27, 30-32, 36, 38-40, 42, 52, 55-57, 61, 62, 65, 67-69, 74, 84-88, 90, 95, 99, 103-107, 110. [6-10, 13, 25, 26, 29, 37, 43, 45, 49, 63, 64, 70, 72, 73, 79, 83, 89, 91.] I. 2 [2]:—Down, Antr. [Arm., Derry]. C.I.:—Jersey.

Subsp. *anglicanus* Rogers. G.B. 22:—2-4, 8, 9, 11, 12, 14, 16, 17, 22, 24, 32, 36, 38, 40, 55, 57, 87, 99, 101 (5). C. I.:—Jersey.

Subsp. *echinatoides* Rogers. G.B. 25 [4]:—14, 16, 17, 20, 21, 23, 24, 35, 36, 38, 40, 49, 51, 52, 57, 62-65, 67, 68, 84, 86-88 (27). [6, 22, 39, 98.] I. 6:—Kerry, Dubl., Westm., Arm., Down, Antr.

Subsp. *sertiflorus* (P. J. Muell.)? E. 3 [1]:—20, 35, 36. [9.] 20. Herts.: High Wood, Bennington, W. H. Coleman! 35. *Monm.*: Whitebrook; Llangattock, etc., A. Ley! 36. *Heref.*: Riggs Wood, Sellack; Harewood, etc., A. Ley! [9. *Dors.*: Bere Wood, R. P. Murray!]

62. *R. echinatus* Lindl. G.B. 56:—3-12, 14, 16-18, 20-25, 32, 34-40, 42, 43, 49, 50, 55, 56-58, 86, 99 (2, 27, 28, 33, 41, 46, 47, 52, 62-64, 67, 69, 76, 81, 88, 89, 95). I. 5:—Dubl., Arm. (Wickl., Meath, Antr.).

63. *R. rudis* Wh. & N. E. 14 [1]:—6, 12, 13, 15-17, 20, 22-24, 34, 36, 55, 57. [25.] I. 2:—Galw., Down. C.I.:—Guernsey.

64. *R. oigocladus* Muell. & Lefv. E. 12 [3]:—3-5, 12, 22, 23, 27, 36, 38, 43, 53, 55. [34, 40, 57.] I. 1 [3]:—Cork [Galw., Down, Derry].

Var. *Newbouldii* (Bab.)? G.B. 10 [3]:—6, 22, 24, 27, 36, 39, 40, 58, 63, 85. [16, 25, 59.] I. 3 :—Dubl., Westm., Down.

Var. *Bloxamianus* Colem. E. 6 :—4, 5, 21, 38, 55, 57.

65. *R. regillus* A. Ley. E. 2 :—34, 36. 34. *W. Glost.* : Haywood, *A. Ley!* See *Journ. Bot.* 1896, 217. I. [1 :—Down, Gilhall Demesne, *H. W. Lett!*]

66. *R. podophyllus* P. J. Muell. E. & W. 14 [2]:—16, 26, 35, 36, 39, 40, 48, 50, 57-60, 62, 63. [49, 65.]

67. *R. Griffithianus* Rogers. E. & W. 3 [4]:—4, 49 (52). [16, 32, 36, 37.] I. [2 :—Galw., Westm.].

68. *R. melanodermis* Focke. E. 3 [1]:—9, 11, 34. [3.] 9. *Dors.* : From the Hants border westward to Evershot, frequent, *the author*. 11. *S. Hants* : From Bournemouth to the Brockenhurst neighbourhood, frequent, *the author*. 34. *W. Glost.* : Buckstane, *A. Ley!* [3. *S. Dev.* : Shalaford and Forder Hill, Egg Buckland, *T. R. A. Briggs!* a nearly allied form?]

69. *R. Babingtonii* Bell Salt. G.B. 23 [2]:—5, 6, 11-17, 21-24, 27, 34-38, 43, 44, 55, 57, 58 (49). [67, 89.] I [1 :—Galw.].

Var. *phyllothyrsus* (Frider.) E. & W. 7 :—22, 23, 36, 38, 42, 43, 57.

70. *R. Lejeunei* Wh. & N. W. 1 :—42. *Brec.* : Woods at Llanwrtyd and Glanau Wells, Builth, *A. Ley!*

Var. *ericetorum* Lefv. E. & W. 13 [3]:—9, 11-14, 16, 17, 22, 36, 38, 41, 43 (24). [2-4.]

71. *R. cavatifolius* P. J. Muell. G.B. 3 [7]:—34-36. [2, 17, 21, 28, 39, 49, 88.] See p. 71.

72. *R. mutabilis* Genev. E. & W. 5 [5]:—11, 13, 17, 41, 42. [5, 6, 21, 26, Yorks.]

Subsp. *nemorosus* Genev. E. 1 :—3. *S. Dev.* : locally abundant for several miles to E. and W. of Plymouth, *T. R. A. Briggs!*

73. *R. Bloxamii* Lees. E. & W. 21 [3]:—8-12, 14, 16, 17, 22, 23, 36, 38, 39, 44, 49, 55, 63, 64, 66 (37-40). [3, 57, 61.] I. 1 [1] :—Galw. [Antr.] C.I. :—Guernsey.

74. *R. fuscus* Wh. & N. E. & W. 21 [2]:—14, 16-18, 22, 23, 27, 31, 34-38, 40, 43, 55, 57, 65 (6, 8, 9). [3, 49.] I. 1 [2] :—Dubl. [Galw., Down].

Var. *nutans* Rogers. E. 7 [2]:—11, 16, 17, 22, 38, 39, 55. [2, 3.]

Var. *macrostachys* P. J. Muell. E. & W. 6 [1]:—18, 22, 36, 42, 50, 58. [57.] I. 2 :—Dubl. Westm.

Subsp. *obscurus* (Kalt.). E. 2 :—7, 36. 7. *N. Wilts* : Woods ascending to Conkwell, *C. Bailey!* 36. *Heref.* : Belmont Wood, *A. Ley!* I. 1 :—*Wexf.* About two miles W. of Wexford, *E. S. Marshall!*

75. *R. pallidus* Wh. & N. E. & W. 24 [2]:—3, 4, 6, 11, 12, 14, 16, 17, 21, 22, 27, 35, 36, 38-42, 55, 57, 58, 62 (28, 43). [23, 30.]

leptopetalus var nov. E. 8 :—11, 13, 16-18, 20, 34, 36.

76. *R. scaber* Wh. & N. E. & W. 21 [11]:—3, 4, 6, 15-17, 21-24, 34-36, 38, 39, 42-44, 55, 57 (5). [11-13, 19, 20, 29, 33, 37, 40, 49, 62.] I. 5 [2] :—Wickl., Dubl., Galw., Westm., Arm. [Meath, Down].

77. *R. thrysiger* Bab. E. 4 [2]:—2-4, 14. [5, 104.] I. [1 :—Westm.].

78. *R. Lintoni* Focke. E. 3 :—6, 27, 35. 6. *N. Somers.* : Rough field between Stourton and Blackslough, *E. F. Linton!* 27. *E. Norf.* : Sprowston Common; copse in Sprowston on borders of Rackheath, *E. F. Linton!* 35. *Monm.* : Chepstow Park, *W. A. Shoolbred!*

79. *R. longithyrsiger* Bab. E. & W. 13 [2]:—1-5, 16, 34, 36, 43, 44, 49 (35, 37). [38, 69.]

botryeros var. or subsp. nov. E. & W. 4:—2, 3, 36, 51. 2. *E. Cornw.*: Gunnislake; St. Mellion, *T. R. A. Briggs!* 3. *S. Dev.*: Egg Buckland, frequent; Fancy; Coleridge; near Beer Alston; Cornwood, *T. R. A. Briggs!* 36. *Heref.*: Shobdon; Main's Wood, etc., *A. Ley!* 51. *Flint.*: Hawarden Park, *A. Ley!*

80. *R. foliosus* Wh. & N. E. & W. 31:—3, 4, 6, 9, 11, 13-18, 20-24, 26, 34-36, 38-40, 55, 57 (2, 5, 12, 37, 46, 62). I. 2:—(Down, Derry).

81. *R. rosaceus* Wh. & N. (typical or nearly so). E. 25:—3, 5, 9, 14-18, 20, 23, 24, 36, 38, 42, 44, 46, 55, 57, 62, 66 (22, 25, 26, 88, 89). Probably by no means an exhaustive list. I. [3:—Kerry, Dubl., Westm.].

Var. *hystrix* (Wh. & N.) incl. var. *silvestris* R. P. Murray and var. *bercheriensis* Druce. G.B. 40 [8]:—1-9, 17, 18, 20, 22, 23, 27, 34, 36, 38-40, 42-44, 46, 48, 49, 55, 57-59, 64 (10-13, 15, 21, 26, 52, 62). [16, 33, 35, 37, 65, 68, 88, 89.] I. 3 [2]:—Dubl., Westm., Antr. [Kerry, Cork].

Subsp. *infecundus* Rogers. G.B. 32:—2-4, 6-8, 12, 16-18, 20-24, 26, 34-36, 38-42, 49, 55, 57-59, 97, 99 (37, 44).

Subsp. *Purchasianus* Rogers. G.B. 5 [4]:—35-37, 57 (34). [59, 62, 91, 92.]

Subsp. *adornatus* (P. J. Muell.). E. & W. 16 [2]:—9, 11, 13, 15-17, 21, 24, 34, 36, 38, 49, 55, 58 (5, 26). [6, 63.] I. 1:—Galw.

Subsp. *Powellii* Rogers. E. 3:—16, 18, 23. 16. *W. Kent*: Shooter's Hill, two stations $\frac{2}{3}$ of a mile apart, *A. H. Wolley-Dod!* 18. *S. Essex*: Epping Forest:—High Beach, etc., abundant, *J. T. Powell!* 23. *Oxf.*: Shotover Hill, two stations, sparingly, *G. C. Druce!*

82. *R. hostilis* Muell. & Wirtg. E. & W. 5:—14, 16, 17, 22, 46 forma.

83. *R. fusco-ater* Weihe. E. 7 [4]:—17, 23, 24, 37-39, 57. [26, 36, 55, 62.]

84. *R. Koehleri* Wh. & N. (typical or nearly so). E. & W. 25. S. [3]:—3, 4, 8, 9, 11, 12, 17, 18, 20, 22, 23, 32-34, 36, 38, 40, 41, 48, 55, 57, 59, 64 (26, 69). [87-89.] I. 3 [5]:—Dubl., Galw., Down [Kerry, Cork, Ferman., Arm., Antr.].

Var. *cognatus* (N. E. Brown). E. & W. 11:—13, 17, 21, 22, 24, 27, 36, 43, 51 (12, 64). I. 3:—Galw., Mayo, Down.

Subsp. *dasyphyllus* Rogers. G.B. 68:—3-8, 11, 12, 14-19, 22-27, 32-36, 39-43, 46, 48-52, 55-58, 60, 62-65, 67, 69, 70, 74, 87 (13, 20, 21, 28-31, 37, 38, 44, 45, 47, 61, 66, 72, 88-100). I. 3:—Arm., Down (Kerry).

85. *R. plinthostylus* Genev. G.B. 2 [2]:—2, 9. [34, 73.] See p. 83.

86. *R. Marshalli* Focke & Rogers. E. 12:—12-14, 16, 17, 21-23, 32, 34, 36, 57. I. [2:—Galw., Down].

Var. *semiglaber* Rogers. E. & W. 7:—36, 42, 44, 48, 49, 51, 52.

87. *R. viridis* Kalt. E. & W. 16 [3]:—6, 15-18, 21-23, 34-36, 42-44, 46, 55. [11, 38, 57.] I. 1 [3]:—Wickl. [Dubl., Galw., Westm.].

88. *R. Durotrigum* R. P. Murray. E. 1:—9. *Dors.*: Whatcombe, *J. C. Mansel-Pleydell!* Charlton Down; Almer; Bere Wood; Bloxworth; between Baillie Gate and Hamworthy Junction, *R. P. Murray!*

89. *R. divexiramus* P. J. Muell. E. 5:—3, 34, 36, 55 (35).

90. *R. Bellardii* Wh. & N. E. & W. 14 [8]:—5, 11, 14-17, 23, 24, 32, 36, 39, 49, 55, 68. [1, 7, 34, 37, 38, 40, 62, 69.] I. [1:—Kerry].

91. *R. serpens* Weihe, incl. var. *rivularis* (Muell. & Wirtg.). G.B. 9 [2]:—5, 11, 14, 16, 24, 35-37, 46. [3, 86.]

92. *R. hirtus* W. & K. G.B. [30:—2-4, 7, 9, 11, 13, 16-18, 20, 22, 23, 27, 34-40, 44, 48, 49, 52, 55, 57, 62, 64, 73.] I. [2:—Galw., Westm.].

Var. *rotundifolius* Bab. E. 11:—2-5, 8 (27, 36-38, 55, 63).
 Subsp. *Kaltenbachii* (Metsch.). E. & W. 9 [1]:—4, 6, 8, 12, 16, 34, 42, 46, 55.
 [14]. I. [2]:—Cork, Down.
 Subsp. *flaccidifolius* (P. J. Muell.). E. 2:—24, 30. *Bucks. and Beds.*: Woburn Sands, *E. F. Linton!*
 Subsp. *rubiginosus* (P. J. Muell.). E. & W. 5:—3, 15, 16, 36, 49. I. 1:—Wexford.

93. **R. acutifrons** A. Ley. E. & W. 3 [2]:—36, 42 (37). [6, 49.]

94. **R. saxicola** P. J. Muell. E. & W. 4 [2]:—13, 22, 23, 42. [5, 35.] I. 3:—Wickl., Dubl., Down.
 R. *horridicaulis* P. J. Muell. W. 2:—41, 42. 41. *Glam.*: Rough bank, Glyn Neath, *A. Ley!* 42. *Brec*: Wood border, Glyn Tarell, *A. Ley!* I. [1]:—Down.]

95. **R. tereticaulis** P. J. Muell. E. 1:—27. *E. Norf.*: Copse in Sprowston on borders of Rackheath and (2 miles distant) Mousehold Heath, *E. F. Linton!*

96. **R. ochrodermis** A. Ley. E. & W. 7 [1]:—4-6, 12, 36, 42, 43. [16.]

97. **R. velatus** Lefv. E. & W. 5 [1]:—36, 42, 55 (35, 46). [39.]

98. **R. dumetorum** Wh. & N. (*sp. collect. excl. vars. following*). G.B. 19:—6, 8, 11, 18, 19, 21, 32, 35, 42, 46, 55-57, 61, 106 (15, 30, 44, 69). I. 7:—Kilk., Wexf., Kild., Dubl., Galw., King's, Westm.

Var. *ferox* Weihe. G.B. 32:—3, 4, 9-12, 14, 16-19, 22, 36, 38, 39, 42, 43, 50, 52, 55, 57, 59, 62, 64, 68, 81 (6, 15, 27, 41, 44, 51). C.I.: Guerns., Jers., Sark.

Var. *britannicus* Rogers. G.B. 12:—14, 16, 17, 36, 42-44, 49, 55, 86-88.

Var. *diversifolius* (Lindl.). G.B. 55:—2-4, 7-12, 14, 16, 17, 20-22, 26, 34, 36, 39, 40, 47, 48, 50-52, 57, 58, 61, 65, 68 (1, 5, 6, 13, 15, 18, 23, 24, 29, 30, 32, 35, 37, 38, 43, 49, 55, 59, 60, 62-64, 69, 89, 106). I. 5:—Queen's, Wexf., Wickl., Kild. (Down). C.I.:—Sark.

Var. *pilosus* Wh. & N. E. & W. 7:—2, 35, 36, 38, 39, 43 (32).

Var. *rubriflorus* Purchas. E. 1:—57. *Derb.*: S.-W., Mid. & E., locally abundant, *W. R. Linton!*

Var. *tuberculatus* Bab. G.B. 37:—3, 4, 6-10, 14, 16, 26, 36, 57, 64 (5, 11-13, 15, 17, 23, 25, 27-29, 32, 34, 35, 37, 38, 40, 45, 55, 62, 63, 70, 88, 89). I. 4 [2]:—Kilk., Queen's, Dubl., Meath [Limer., Antr.]. C.I.:—Jersey.

Var. *concinus* Warren. E. 8:—17, 55, 57, 60, 62 (36, 39, 58).

Var. *fasciculatus* (P. J. Muell.). G.B. 16 [5]:—10, 36, 38, 50, 55, 57, 62, 64 (6, 13, 15, 16, 23, 26, 28, 29, 31, 35, 39, 40, 43, 58, 100). [22, 25, 63, 88, 89.] I. [3]:—Galw., Down, Derry].

99. **R. corylifolius** Sm. (*sp. collect. incl. vars.*). G.B. 89:—1-18, 20-46, 49-52, 55-66, 68-74, 76, 77, 81, 84, 86-92, 94, 96, 97, 100, 101, 104, 106, 107, 109, 110. I. 15:—Kilk., Queen's, Wexf., Wickl., Kild., Dubl., Limer., Galw., King's, Westm., Mayo, Arm., Down, Antr., Derry. C.I.:—Guerns., Jers.

Var. *sublustris* (Lees). G.B. 61:—1-4, 7-12, 14, 16, 17, 22, 23, 27, 33, 36, 38, 40, 42, 43, 51, 52, 55, 58, 60-65, 68, 86, 88, 104 (6, 13, 15, 20, 21, 25, 26, 28-30, 32, 34, 35, 37, 45, 57, 69, 71, 73, 74, 77, 89, 91, 92, 94). I. 11:—Kilk., Queen's, Wickl., Dubl., Limer., Galw., King's, Westm., Arm., Down, Derry. C.I.:—Jersey.

Var. *cyclophyllus* Lindeb. G.B. 48 [1]:—2, 4, 7-10, 14, 15, 20, 22, 23, 36, 38, 43, 50, 51, 55-57, 62, 68, 101 (6, 12, 13, 21, 26, 29, 30, 32, 34, 35, 37, 40, 45, 46, 49, 52, 58, 59, 64, 74, 76, 86, 89, 91, 92, 100). [88.] I. 6:—Queen's, Wexf., Dubl., Mayo, Arm., Antr. C.I.:—Guerns., Jers.

100. **R. Balfourianus** Blox. G.B. 38 [8]:—2-4, 9, 11, 14-17, 21, 23, 30, 38, 52, 55, 57, 58, 63, 108 (20, 22, 26, 29, 32-37, 40, 42, 51, 54, 62, 64, 69, 81, 89). [1,

5-8, 10, 25, 88.] I. 6 :—Cork, Queen's, Dubl., Westm., Mayo, (Kerry).
C.I. :—Sark.

101. **R. cæsius** Linn. (*sp. collect.*). G.B. 71 :—1-12, 14-18, 20-29, 31-44, 46, 48-55, 57-66, 68-70, 74, 80, 84-88, 91, 109. I. In all the 12 districts of *Cyb. Hib.* ed. 2, though 'very rare in the N.-E.' Probably present in every county of the British Isles. C.I. :—Guerns., Jers.

102. **R. saxatilis** Linn. G.B. 69 :—2-4, 6, 33-35, 37, 39-44, 48-50, 54, 57, 59, 60, 62-77, 79-81, 83, 85-112. I. 16 :—Kerry, Queen's, Wickl., Dubl., Clare, Galw., King's, Westm., Longf., Sligo, Leitr., Rosc., Doneg., Down, Antr., Derry.

103. **R. Chamæmorus** Linn. G.B. 37 :—47, 48, 51, 57-60, 63-70, 77-80, 83, 86-94, 96-98, 105-109. I. 2 :—Tyr., Derry.

For ready reference a key to the Watsonian comital numbers used in the Appendix is here added.

1. West Cornwall.	40. Salop.	76. Renfrew.
2. East Cornwall.	41. Glamorgan.	77. Lanark.
3. South Devon.	42. Brecon.	78. Peebles.
4. North Devon.	43. Radnor.	79. Selkirk.
5. South Somerset.	44. Carmarthen.	80. Roxburgh.
6. North Somerset.	45. Pembroke.	81. Berwick.
7. North Wilts.	46. Cardigan.	82. Haddington.
8. South Wilts.	47. Montgomery.	83. Edinburgh.
9. Dorset.	48. Merioneth.	84. Linlithgow.
10. Isle of Wight.	49. Carnarvon.	85. Fife and Kinross.
11. South Hants.	50. Denbigh.	86. Stirling.
12. North Hants.	51. Flint.	87. West Perth and Clackmannan.
13. West Sussex.	52. Anglesea.	88. Mid-Perth.
14. East Sussex.	53. South Lincoln.	89. East Perth.
15. East Kent.	54. North Lincoln.	90. Forfar.
16. West Kent.	55. Leicester and Rut- land.	91. Kincardine.
17. Surrey.	56. Nottingham.	92. South Aberdeen.
18. South Essex.	57. Derby.	93. North Aberdeen.
19. North Essex.	58. Chester.	94. Banff.
20. Herts.	59. South Lancaster.	95. Elgin.
21. Middlesex.	60. West Lancaster.	96. East Inverness.
22. Berks.	61. South-east Yorks.	97. West Inverness.
23. Oxford.	62. North-east Yorks.	98. Argyle.
24. Bucks.	63. South-west Yorks.	99. Dunbarton.
25. East Suffolk.	64. Mid-west Yorks.	100. Clyde Isles.
26. West Suffolk.	65. North-west Yorks.	101. Cantire.
27. East Norfolk.	66. Durham.	102. South Ebudes.
28. West Norfolk.	67. Northumberland (south).	103. Mid-Ebudes.
29. Cambridge.	68. Cheviotland.	104. North Ebudes.
30. Bedford.	69. Westmoreland and North Lancs.	105. West Ross.
31. Hunts.	70. Cumberland.	106. East Ross.
32. Northampton.	71. Isle of Man.	107. East Sutherland.
33. East Gloucester.	72. Dumfries.	108. West Sutherland.
34. West Gloucester.	73. Kirkcudbright.	109. Caithness.
35. Monmouth.	74. Wigton.	110. Hebrides.
36. Hereford.	75. Ayr.	111. Orkney.
37. Worcester.		112. Shetland.
38. Warwick.		
39. Stafford.		

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